The Builder.

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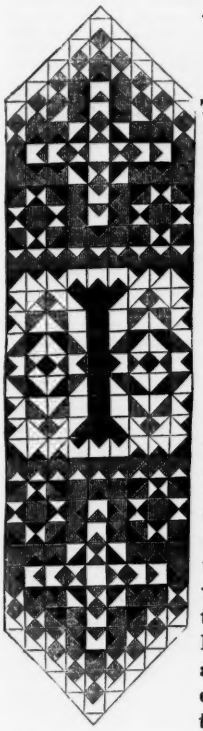
Designs for the Proposed New Cathedral in Edinburgh.



It may be necessary to remind readers that six architects were invited to submit designs for a new cathedral to be erected in Edinburgh, from funds left for that purpose by the late Miss Walker, of Drumsheugh. The site is in the centre of the west termination of Melville-street, is open on all sides, and is admirably adapted for the display of an important public building. The sum set apart by the trustees to cover all charges is 65,000*l.*, and the competing architects were required to adapt their designs so as to keep the cost within that amount. The designs are exhibited in the rooms of the Royal Scottish Academy, under motto, but any one who has a knowledge of architecture and is acquainted with the works of the competitors can easily penetrate the *incognito*; indeed, the names of the authors of the respective designs are openly spoken of and printed, and it needs no apology on our part to follow suit; adopting the ascription of names already published, although we shall not be surprised to find two of them misplaced.

Each competitor has accompanied his design with an explanatory memorandum, and the course we propose to follow is to allow each architect to explain his own design, and make our comments upon it thereafter.

Taking the drawings in the order in which they presented themselves to us, we find the first series to the left, twelve in number, under the motto "Fidelitas," and which are assigned to Mr. Burges. The author says:—

"*Site.*—The site being exposed on all sides, and as the west elevation can be well seen from Grosvenor-crescent, the architect has thought it desirable to keep in view the orientation of the building, and has shown it lying due east and west, and on a line forming the axis of Grosvenor-crescent and Melville-street. Should the trustees deem it desirable to show the principal façade to Melville-street, it could be arranged with equal ease; but as a departure from the ancient practice, and on other grounds, it would not perhaps be advisable. A slip has been fixed on No. 8 drawing, to show how the building may be adapted to either arrangement. Assuming that the true orientation be observed, the western entrances would front Palmerston-place and Grosvenor-crescent, while that to the chapter-house and entrance for the clergy would be from Manor-street, and facing Melville-street.

Level.—It is proposed to raise the floor of the nave 4 ft. above the level of Melville-street, and thus give a broad, massive base to the building, as well as dignity to the entrances by a flight of steps to the doorway.

Coutes House.—With this house the plan does not in any way interfere, and it may be allowed to remain or not, as desired by the trustees; but it does not appear to present sufficient merit, either architecturally or otherwise, to render its existence of great importance: and the residences for the bishop and clergy would be best considered quite apart from the present old building.

Dimensions.—Length of nave, 130 ft. long by 30 ft. wide; length of aisles, 110 ft. long by 15 ft. wide; length across transepts, 100 ft. long by 30 ft. wide; length of choir, 65 ft. long by 30 ft. wide; chevet or circumambient aisle, 15 ft. wide; extreme length over all, 265 ft.; width across west tower, 82 ft.; width across transept, 110 ft.; height of interior to groin, 75 ft.; height to ridge, 107 ft.; height of west towers, 220 ft.; height of central ditto, 285 ft.

Plan.—In arranging the plan, the convenience and comfort of the congregation have been carefully studied, and the architect has endeavoured to provide for this by the introduction of a large narthex at the west end of the nave, entered through a triple porch, and by a roomy south porch into the south aisle (the necessity for subsequent inside wooden porches to prevent cold draughts being thus avoided). The font is placed on the left of the south porch on entering; the pulpit at the north-east pier of nave, as being the best position for sound as well as sight. It is proposed to seat the nave only with benches, the transepts being left clear for temporary seating by chairs or otherwise.

Accommodation.—The accommodation is as follows:—Sittings in nave and aisles, 1,082; sittings in transepts, 336; sittings in choir, 64; sittings in stalls, 24: total, 1,506.

Daily Service.—As before mentioned, the transepts and space under the lantern being kept clear, the daily services would be provided for by chairs placed in this part of the building, and by which nearly 500 persons could be accommodated; or by seating the central crossing only, 150. The architect has adopted the chevet, or mode of carrying the aisles quite round the choir, thus giving free access from the vestries and chapter-house to all parts of the building without crossing the choir or chancel, and also providing a very suitable space for mural monuments and brasses, while at the same time it would immensely improve the architectural effect of the building,—a mode of treatment happily enforced and illustrated in Mr. Beresford Hope's work, 'The English Cathedral' (chap. vii.). The chapter-house opens off the north side of this circumambient aisle, and is approached through a wide corridor, lighted on the east side by a rich arcading, and bounded on the west by the vestries for the clergy. The chapter-house is in the form of a parallelogram, 53 ft. by 26 ft., and capable of accommodating 150 people. A grand organ might be placed in the loft or the narthex at the the west end.

Style of Design.—A severe and comparatively early style of French Gothic has been selected, so as to avoid excessive detail and carving, and as approaching more nearly to the best period of Scottish Gothic, which, in much of its massive, severe character, is more nearly allied to the Early French than any other, and many details may be found identical in both. The aisle-walls have been kept perfectly plain, with the view of giving value to the richness of the clearstory, where the principal decoration has been concentrated, as being a leading feature outside and inside the building. It is contemplated to groin the ceilings throughout with stone ribs, and chalk or concrete filling, the latter presenting many very commendable features, both as to strength, economy, and lightness."

This is undoubtedly a very fine design, possessing much grandeur, harmony of proportion, and exquisite detail, and it improves upon one by familiarity. The grouping of the three spires would form a marked feature in a part of the city deficient in outline, and would unmistakably point out the church as the cathedral. As seen nearer at hand, too, either from east or west, the composition is unexceptionable; but to secure the finest possible architectural effect we would be inclined to adopt the author's suggestion of reversing the usual arrangement and place, what is usually the western feature at the east, so that the more important façade would be seen along the whole length of Melville-street. Several precedents, ancient and modern, can be found for such an arrangement both here and on the Continent, but there was always a good cause for it, and it may be contended that the mere securing of a better architectural effect is not a sufficient reason for breaking through an almost universally recognised practice, and one which is wound up with old associations and ideas.

The interior is even finer than the exterior. The relative proportions of aisle, triforium, and clearstory, are charming, as is also the distribution of the light, which is mainly from above.

Looking, however, to the matter of cost, we have grave doubts as to the accuracy of the architect's calculations. Probably, were the "wealth of images," and the spires left to be added in the future, the sum at command might suffice. But upon this subject the committee will doubtless be guided by the opinion of the professional man whom they are, we understand, to call to their assistance.

We do not agree with the author as to the worthlessness of the old manor-house which adjoins the site, and would stand close to its northern elevation. It is a very quaint and characteristic example of Scottish baronial architecture, and its retention would enhance rather than detract from the effect of the new edifice.

Next in order we have a series of eleven sheets bearing the motto "Non ignotæ civitatis municeps." The general arrangement is almost identical with that of the recently-erected cathedral at Inverness by Mr. Ross, and is thus described:—

"The author of the design bearing the motto, 'Non ignotæ civitatis municeps,' submits the following remarks regarding his design for the proposed Cathedral of St. Mary:—The whole of the internal area, clear of columns, and excluding the choir, amounts to 11,989 square feet. This, divided by 7 ft. for each person,—the usual amount allowed (including passages) by the London Incorporated Society for the Enlargement and Building of Churches, gives accommodation for 1,713 persons. Out of this must be deducted sundry spaces not available, so that the area may fairly be taken to give the required accommodation. Chairs in a building of this description are much to be preferred to fixed benches. For ordinary occasions, a space might be enclosed by temporary wooden barriers, as in Continental churches. As it is well known that it is more advantageous and more economical to keep the warming apparatus always in gentle use, there will be no difficulty in securing a proper temperature for week-day services. On Sundays the apparatus will be worked to its maximum. It is proposed to place the large organ, divided into two parts, in the western gallery, while a smaller instrument, to lead the choir, is placed on the floor near the stalls. The whole of the roofs, except the aisles, are intended to be boarded, which will preclude any difficulty as to the preacher's voice being distinctly heard. The clock and peal of bells may be placed in the north-western tower. It is generally agreed that a complete cathedral should consist of the three great divisions, arcade, triforium, and clearstory, and its parts should be nave and aisles, choir and aisles, transepts, and one or more towers. In the present instance the sum of money to be spent utterly precludes any central tower, and the author has consequently elected to put two towers at the west end, where they not only help the western façade, but perform the useful office of masking the western ends of the aisles. The spires will be of wood, covered with lead, and the flèche at the intersection of the nave and transepts will also be of the same materials. In view of the comparative smallness of the sum proposed (65,000*l.*), in relation to the accommodation required, it naturally follows that the fittings must be of the most simple character. In order to reduce the expenditure still more, the author would suggest, in case of necessity, the substitution of a continuous wooden barrel-roof for the stone vaulting in the nave and choir aisles. It should also be noticed that the figure sculpture could not be included in the sum, but would be a possible future extra."

The exterior of the design is wanting in dignity. There is, however, considerable beauty in the west elevation, with its two towers and leaded spires, which are quaint yet elegant. Were this design adopted, the call to reverse the orientation would be more imperative than in the preceding instance, the eastern elevation being somewhat monotonous and undignified. The interior is more impressive than the exterior, and would be much better without the meretricious colouring proposed to be introduced. We cannot say we like the effect of the slender shaft which runs up from the ground along the face of the cylindrical columns of the nave to meet the hammer-beams of the roof; nor do we much affect the tie-beams, which appear to be a necessary part of the construction. There is nothing national in the style adopted, unless it be the tartan costumes of the worshippers. The architect has conscientiously endeavoured to keep within the mark as regards cost, and we have no doubt that the design could be carried out in its entirety for the sum indicated.

Nine drawings, bearing the device of a white cross upon a circle of blue, are allocated to Messrs. Peddie & Kinnear. In the memorandum it is said that,—

"In preparing the accompanying design, it has been considered essential, in the first place, that there should be a grand central tower. Situated in the middle of an open space, and surrounded with houses of a classic character of architecture, the cathedral will harmonise best with the situation and the surrounding buildings if its leading feature be placed in the centre. Moreover, as the chief views of the cathedral, and the principal approaches to it, will be from the east, and as that end of the building will therefore be in some respects the most important, it is thought that this treatment of the design will give it a much grander and more imposing effect than if its main features were to consist of large western towers. At the same time, in order to mark more distinctly the cathedral character of the building, it has been thought that there should be two smaller towers at the west end. The general style of the architecture is Gothic of the best period, with as much as possible of the Scottish variety. Scottish Gothic is quite distinct from English Gothic. There are noble examples of it in the cathedrals of Elgin and Dunblane, the abbey of Sweetheart, &c., buildings which owe their effect to the grandeur of their general design and the simplicity of their details, rather than to elaborate ornamentation and minute carving. It has been sought to make the cathedral, which, from its position and size, will be *the cathedral of Scotland*, thoroughly Scottish in character. The accommodation provided is for 1,557 sitters exclusive, and 1,677 sitters inclusive, of the end gallery. As nothing is said in the instructions as to having a gallery, the design has been made of such dimensions as to give the required accommodation without it; and, accordingly, the gallery has not been included in the estimate of cost. It has been represented on the drawing, however, in order, to show how the design is capable of affording additional accommodation should it be required. The design has also been arranged so as to be adopted for a still farther extension of the accommodation, by introducing fixed seats or chairs in the large space under the great tower, between the choir-screen and the front of the pews. With the sittings in the gallery, and those for which this space has been left under the tower, the total accommodation would be 1,731. With no such provision for any extension of accommodation, the design might, of course, be reduced in size by about one-eighth, with a very material reduction in cost. The ground plan shows how the sittings may be arranged in pews, but in the internal view the pews are omitted, in order that the effect of the architecture may be better seen. Fixed pews are always destructive to architectural effect, and it is suggested that in the present case movable benches or

chairs might be used, as represented to some extent in the view. Sculpture has been introduced to some extent both internally and externally, as was almost invariably done in the best examples of Gothic buildings. The statues are not included in the estimate of cost, however, because, though improving the design, they are not essential to it. The niches and canopies may be left unoccupied, as is often seen in old buildings, leaving statues to be afterwards gradually supplied."

The author or authors of this design, in the endeavour to be national, have outheroded Herod. The ancient builders had more reserve and good taste than to repeat a *tour de force* like the open crown of St. Giles's, on the towers of the same building, nay, even in the same city. The towers here stand cheek by jowl, like sturdy Highland porters waiting for a job, the large fellow in the centre swinging about his shoulder-straps in his impatience to be employed. Seriously the two west towers are not improvements upon St. Giles's, and that at the intersection of the crux, which is taken from Glasgow, is spoilt by the addition of great useless flying buttresses. The remainder of the detail is in keeping, being scattered and restless, and not of the purest type. There is more repose in the interior, but it is rather cold and uninviting.

In following the national tradition, much better material is to be had than that adopted in this design, as is sufficiently obvious in the succeeding one, which bears the legend, "Auld Lang Syne," and is attributed to Sir G. G. Scott, and represented by thirteen beautifully executed drawings. The author thus explains his purpose:—

"In designing a church which is to take the rank of a cathedral, and that in the metropolis of Scotland, and which must nevertheless be capable of being erected for a moderate sum, one has to consider carefully what are the architectural and what are the ritual essentials of a cathedral, as distinguished from a church of less dignified rank. It would not be easy to define the essential differences found to exist among ancient churches between a cathedral and an abbey, or even a great collegiate church. The latter were often promoted to the higher dignity, and were found in every way fitted for it. Our own question, however, lies between a cathedral and a parochial church; and even here, it is not so easy as it might appear to define the difference, inasmuch as many large parish churches equal, and even exceed, in scale and dignity of aspect, cathedrals of a smaller size. In the present instance, even, the proposed dimensions of the cathedral are equalled by those of some parochial churches, and in some instances the ritual arrangements of such churches may also be on a nearly equal scale. Our aim, then, must, I think, be positive rather than relative. The church must, both within and without, bear such unmistakable credentials of high dignity as to be obviously suited to its rank as the chief church of the diocese, and that which its chief pastor adopts as more especially its own; and perhaps the great essential is that the choir should be of such ample dimensions as to allow the diocesan clergy, from time to time, to assemble there in the presence of their bishop. There are, however, no universal rules for the form of a church of cathedral rank. If we were to say that it should have a central tower, it would at once occur to every one that many abroad, and several in Great Britain, have not that feature. If we were to moderate this demand, and say that it should at least be cruciform, it would be replied that we have in Britain at least two,—Dunblane and Llandaff,—which are not so, and so no feature can be named which is the special and unvarying characteristic of a cathedral. All, then, which can be demanded for it is that it should be as dignified a church as the circumstances at command will permit, and that it shall as a rule, be the noblest church in the city and diocese in which it is placed. Although, however, a cruciform plan and a central tower are not indispensable characteristics, it must be admitted that both are in a high degree conducive to dignity of aspect, and are consequently most desirable features in a cathedral church. No plan is so noble or so impressive as that which is founded on the Cross; and the cross plan is never so emphatic as when a central tower crowns its intersection. I have therefore chosen as my [more normal] design, the customary and typical form of a cruciform church, with a central tower, only making the central crossing with the nave and transepts unusually wide in their proportions, so as best to provide for congregational purposes, and so constructing and planning the supporting piers of the tower as to offer the least practicable amount of obstruction to view and voice. I have in this design given aisles on either side to the transepts as well as to the other arms of the cross, which tends to produce a great amount of space in the part most useful to the congregation. As to the internal arrangement, I will mention that I have not ventured to show a high choir-screen, fearing that objections may be felt to it, but have shown a low screen or septum, like those at Florence, Monreale, &c. I should, however, as a matter of taste, rejoice to substitute the higher form of screen. Nor have I shown close screens or canopies on the sides of the choir, because they render the choir-aisles unavailable except for passages. I have provided for the organ in this manner: the lighter parts, especially the 'choir organ,' with the keys and the organist's seat, I have placed close to the first bay on the north of the choir; but the larger and more cumbrous parts I have placed in the eastern aisle of the north transept, immediately behind a place where the sound would spread itself freely through both choir, transepts, crossing, and nave. The communication would be by trackers passing beneath the floor of the aisle. There is, however, the possible alternative of placing the organist and the choir organ, &c., as already mentioned, but placing the heavy parts in the triforium of the choir and transept. The arrangements of the choir will speak for themselves. The seating of the nave, &c., would be by means of chairs. The question you have suggested as to the place for the congregation during ordinary daily services, as distinguished from their place on greater occasions, I have carefully considered; but do not see any necessity (but the contrary) for providing a distinct position. It would seem to me a great pity that the services on minor (though the most frequent) occasions should be in a less dignified place than at other times. It is an arrangement not known in this country, excepting for early services, nor do I think it desirable. The question whether at ordinary week-day services any part of the congregation should be admitted within the choir seems one which should be left to the decision of the bishop and clergy. It is not essential to the arrangement to decide it while planning the cathedral, as if not so admitted they would simply occupy the space in front of the choir-screen according to their numbers. Though the choir of a parochial church should be so planned as to hold no more than the clerical and choral bodies, that of a cathedral should do more. It should be capable of containing in addition so many, at least, of the diocesan clergy as are likely on any great diocesan occasion to assemble."

The style is of the Earliest Pointed, similar to that of Dunblane and Elgin, two of the finest architectural remains in Scotland.

The general aspect is simple and unaffected. Ornament is sparingly used, and where it is applied it is concentrated in the most suitable positions. The dominating feature is the central tower and spire, to which the other portions lead up the eye, producing a very effective composition. The effect as seen from a distance would be remarkably good, though not so striking as that of the three spires in the design first referred to. The interior is everything that could be desired, were it not for a singular freak indulged in in placing some hard detail, of a Norman character, upon the ingoings of the clearstory windows. The effect, in an artistic point of view, is disturbing to the perfect unity which otherwise prevails. As in the design marked "Fidelitas," the light is principally derived from the clearstory, and the whole area is vaulted over. The architect has evidently done his utmost to give the best design compatible with the cost.

The next set of designs, eight in number, bear the motto "In hoc signo X," and are evidently the work of Mr. Street. They are thus referred to by the author:—

"In my design, both in plan and detail, I have most studiously kept in view the importance of adhering as closely as possible without servility to the best national architectural traditions and examples, and I will, with your permission, say a few words as to what these are. Long and careful study of Mediæval buildings in Scotland leads me to certain very distinct conclusions. It will be found that from the end of the twelfth to the end of the fourteenth century (which is the period during which we all now maintain the Gothic style to have been at its best), all the existing examples are the work of men who were in close and intimate connexion with, if indeed they were not often the very same men as, the architect of the buildings in England north of the Trent. There is a broad distinction between the work of English architects north and south of the Trent; and though it is easy to point to a number of curious coincidences in design between buildings in the north of England and others in Scotland, it is not, I believe, possible to point to a single example of the same connexion with the works of architects south of the Trent. This position might be illustrated at length, but in this place it will be sufficient to ask any one to compare the transepts of Hexham with the transepts of Pluscardine Abbey, near Elgin; or again, to go from Lanercost, in Cumberland, to Dryburgh Abbey. In each case he will see the same hands at work on both sides of the border. As we might, therefore, without disregarding Scottish traditions, safely join a study of the abbeys and cathedrals of the north of England to that of the generally ruined, but still most interesting, abbeys and cathedrals of Scotland. In truth, in choosing to limit my studies for this work to the Scottish churches of the thirteenth century, I am running no risk, for I believe that it would be difficult to find buildings more pure in detail, more graceful in design, or more suited to our wants in their comparatively modest scale, in any part of Europe. The country which can boast of such examples as Glasgow, St. Andrews, Dunblane, and Elgin Cathedrals, or the Abbeys of Pluscardine, Sweetheart, and Dundrennan, Melrose, Dryburgh, and Holyrood, has no need that her architects should leave their own country in search of what is most appropriate and most beautiful. All these buildings, with one exception, are of very nearly the same date,—the first half of the thirteenth century,—and it is in the style of this period, accordingly, that I have made my design. With the one exception of Glasgow Cathedral, they are all very simple in their details; and I need hardly point out to you that the funds at your disposal will not suffice for a large and stately church, and at the same time for one whose design is full of rich, curious, and elaborate details. As to the plan:—My plan is upon the usual cathedral scheme of a cross church. The choir of moderate length, so as to afford proper accommodation for clergy and choristers only. The nave and transepts of ample dimensions, to accommodate the numbers required. The choir furnished with aisles, for the convenience of passing all round it, and of seeing and hearing well in all parts, and the exterior marked as a cathedral by its central lantern (open from the floor inside), and for the adornment of the city by its lofty western tower. For the accommodation of the worshippers in the best way, I have made my nave unusually wide and spacious. All its occupants will be within view of the altar, pulpit, and choir, and its length is such as to allow of the preacher and the choir being heard to its fullest extent. I have provided a chapel opening on the east side of the south transept, for use for occasional or daily services, or for early communions, when the congregation is small, and the proper choir may seem inconveniently large. The organist is so placed between this chapel and the choir that he can attend equally to services held in either place; and the organ, opening as it does both to the choir and the south transept, will be heard equally well all over the church. And here it may be well to observe that the position of the organ has not been chosen without care or experience on the subject. I believe that nothing is more certain than that a church organ should be well raised above the choir and floor, and that the chamber in which it is placed should be of sufficient size, and finally vaulted in stone, so as to prevent the existence of any recesses above the instrument, and so as to throw out the whole of the sound from the organ-chamber into the church. If the chamber which I have designed is required for an enormous instrument, it may, with the greatest ease, be exactly doubled in size, by carrying it the whole length from north to south of the south transept, instead of only half the length, as shown on my plan; and its height may also easily be increased; and, as will be seen by reference to the elevations, these alterations would be made with only very slight modifications of any part of the design, and with no damage in any way to its effect. All this is matter of detail, which would, in the end, of necessity, have to be settled in consultation with the organ-builder, and when one knows the exact size of the instrument to be provided for. The arrangement of the choir will, I believe, be found to be very convenient. There is room for forty clergy and choirmen in its stalls. The stalls for the clergy are brought forward under the lantern, so that their occupants may be well seen and heard, and with the result that the choristers will occupy the western bay of the choir, below the organ, and they will be best heard by the congregation.

Acoustics.—It is somewhat difficult to deal with this portion of the subject anonymously. One evidence of success is worth a thousand essays on the means of obtaining it. I may say, however, that I depend upon the vaulting of my choir and transepts for throwing the sound well out into the church, and on the form and material of my nave roof for resonance. I believe that the cells in the nave ceiling, the arches in the nave walls, and the passages and recesses in the thickness of the walls would entirely prevent any echo, and that, with the pulpit, and choir seats, and organ, placed where I have put them, every one could hear well, and music in particular would be certain to be effective.

Cost.—On this point I have been most careful not to exceed the limit set. I have made a careful calculation of the cost, founded upon my knowledge of the cost of corresponding buildings, and am satisfied that the work, as drawn by me, will be completed for the sum you have named."

Severity of character and mastery of detail are manifested in these designs, which are more calculated to please the mind of the initiated than to charm the general beholder. The plan followed seems almost wilfully adopted as the least suitable for the site. The best view of the building will be obtained from the east, where there is an uninterrupted vista of about a quarter of a mile; but the author has placed a central tower and a western spire in line, the latter being in the centre of the west elevation. Then again, the extreme severity of the style would form a harsh contrast to the modern, fashionable streets which surround the site; and the central tower, with its low slated roof, is more suited to a country church than to a metropolitan cathedral. The interior is more pleasing than the exterior, but we miss in it the lofty aspiring effect and pleasing variety found in the designs marked "Fidelitas" and "Auld Lang Syne." It would form a marked building anywhere, but appears more suited for a country district than for the west end of a city.

Last and least is the design with the motto "Essayez-moi," represented by eleven drawings. The author gives the following description of his work:—

"The principal entrance, as shown by the plan, is from the west, and the doorway is approached by a flight of five steps; there are also doors in the north transept and south aisles of the nave. On the left-hand side of the entrance is placed the baptistery, and on the right the vestry. The nave is 98 ft. long, and 33 ft. 3 in. broad between the pillars, and the side-aisles are 17 ft. wide. The transepts are 106 ft. 6 in. in length from north to south, and 32 ft. wide. The choir is 78 ft. 6 in. long, and the same width as the nave; and the floor of the choir is raised five steps above the level of the floor of the nave. The Lady Chapel is divided from the choir by the altar-screen, and is 33 ft. 3 in. in width, by 29 ft. long; and where it joins the Lady Chapel there are placed two octagonal side-chapels, which are carried up externally as memorial-towers in commemoration of the two Misses Walker. The first floors of these towers above the chapels to be used as muniment-rooms, and the upper floors will be available for a chime of bells. The organ for ordinary use would be placed under the archway in the first bay of the north aisle of the choir; but as it would be most desirable to have a large organ for special occasions, provision is made for its being placed over the west entrance, in connexion with side-rooms for the accommodation o the musicians, as shown by the plan of the clearstory. The elevations of the different fronts show the style and character of the building, and the walls, both outside and inside, would be faced with ashlar, the stones of the outside face being built in random courses. The pillars between the church and the side-aisles, and also the great angle-piers under the centre tower, would be executed with Craigleith stone. The wall-spaces between the apex of the arches under the tower, and the sills of the windows in the first stage of the tower, to be panelled, and have the panels filled with fresco paintings, illustrating some of the principal events in the history of Christ, and the wall-space over the archway between the choir and Lady Chapel filled with a fresco of the Last Judgment. These frescoes are indicated in the sketch view of the interior. In designing this church it was considered of particular importance to have the east front towards Melville-street as effective as possible, as it would be seen along the whole length of the street, and for this reason the apse, or Lady Chapel, has been made decagonal in form, to remove all appearance of an ordinary street building; and the two memorial-towers added to show the purpose of its erection, and also to give the proper effect of a cathedral church."

The style adopted is Scottish of a late Flam

boyant type, with a strong suspicion of a German, spiky, element at the east end. The great central tower is here again surmounted by the open crown of St. Giles's carried up to rather a disproportionate height. The window tracery is somewhat monotonous and heavy throughout. The interior is pervaded by a feeling of flatness, which is not relieved by the commonplace panelling which takes the place of a triforium.

To sum up our remarks, this competition has brought out clearly that the local architects invited to compete are no match for their southern brethren in the production of a design for an ecclesiastical edifice. We have no hesitation in saying that there are younger men who have been kept out in the cold who would have been nearer the mark. Be that as it may, the trustees have got from each competitor good value for the retaining fee of 100*l.*, and they have secured at least two designs either of which if executed would provide a church of which any city might be proud, and which will greatly excel any yet existing in Edinburgh.

ON CHARACTER IN ART.

The word character, in ordinary language, has a meaning somewhat different from its original signification. It is one of the many words, in the English tongue, which have gradually assumed a conventional importance that is not their etymological inheritance. The original meaning is, a mark or incision. The old English word "ear-mark" is a good parallel. Hence the term was applied to those incised marks which designated vocal sounds, or numeric values, and which we usually call letters or figures. It is probably from the use of such terms as Greek characters, or Hebrew characters, that we became accustomed to convey by the word in question the idea, first of the entire form of an object, and then, of something more than its form, of its essential distinctions; or of the physiognomy, or outward indication by which such distinctive idiosyncrasy is expressed.

The word character, when correctly used in reference to art, has two distinct meanings, which may be traced to the gradual development of the import of the word. There is the character of the artist, and there is the character proper to the material in which he works. These two species of character are intimately related to, and react on, one another, but none the less do they convey two distinct ideas. Thus the character of the paintings of Greuze differs intelligibly from that of the paintings of Meissonnier. And thus, in the other sense of the word, the character of a relief modelled in wax differs from that of a relief modelled in clay.

The character of an artist is rarely to be grasped from a single example of his work, or rather it may be said that none but judgment of the most accomplished order can so detect it. But if numerous works of the same artist are collected together, the character that is common to them all may be observed at a glance. Here lies the secret of the value of such collections as contain numerous examples by the same master. Their instructive power, as illustrating the artist by himself, is very great. A remarkable instance of this is to be noted in the Hertford Collection, of which we some little time since gave an account. The visitor to that exhibition passed through a phase of positive education with reference to several of the artists there represented. Every one, for instance, is more or less acquainted with Greuze. Most of us have formed such a judgment of his works as to be able to recognise them at a glance. As to their ordinary motive, their style of handling, and the various qualities, good and bad, which are evinced in almost every example, there might seem not to be much that is left unsaid. But Sir Richard Wallace hangs side by side no less than twenty-two works by Greuze. Some of them exhibit as wide a difference in motive as is probably to be found between any of the productions of the artist. And yet the similarity of idea and of treatment,—in fact, the identity of character,—that pervades these twenty-two paintings, is such as to give the observer a peep, not only into the studio, but into the very mind, of the artist. Certain points are invariably evident. You gain such an insight into the mode in which Greuze looked at nature, no less than into that by which he represented it, that you can at once fix upon a subject that he would have chosen, and feel that it is the want, not of conception, but of manipulative power alone, that prevents you from being able to show exactly how he would have painted it. Again, from the Murillos in the same collection, an idea may be formed of the character of that great master, at which it would have taken much time and much travelling to enable a student to arrive in the absence of so favourable an opportunity. Eleven paintings by Murillo illustrate so forcibly the main features both of his earlier and of his later style, that what, perhaps, you knew from authority you instinctively feel from observation. One sees the rare power and great breadth and grasp of subject which Murillo attained in his portraiture of rustic life. One sees the manner in which his ideas condensed and crystallised when, in his later days, he devoted his pencil to religious, imaginative pictures. Seven or eight Madonnas are but repetitions of the same rather heavy, but no doubt very worthy, model. She is so impressed on the memory by repetition that she would be recognised again at a glance, under all circumstances and in any costume.

In fact, a study of this nature, of painter by painter, confining the attention for the time to the works of a single artist, leads the judgment to the unexpected conclusion that the great portrait-painters are the most imaginative of their profession. The view must be taken with reason, and expressed with due limitation. For, in the first place, it must be confined to that extremely rare class, great portrait-painters. In ordinary limners nothing can be less obvious than the display of imaginative power. Photography has no imagination; and persons who think that an accurate reflection or delineation of features constitutes a portrait, form, as is but too evident, the majority of those with whom we are acquainted. Again, when we rise from the very poorest to the second-rate portrait-painters, we find the individual character of the artist to be for the most part reflected, with inflexible fidelity, from his canvas. One English portrait-painter, of high rank, if we judge by fashion and by price, can be recognised in a moment by the polish he gives to the boots of his sitters. He ought to have been salaried by Day & Martin, or by Warren, whose famous cat, swearing at her reflection in a polished boot, was once to be seen on the walls of every European capital. Again, if we take an artist of much higher rank,—Sir Thomas Lawrence,—it is impossible to mistake the character which is reflected from himself over his subjects. It is, no doubt, a courtly and agreeable personality, but it is one which is so universally present in every portrait from his easel, that we are sure it must have been that of the artist, and not of his sitters.

But with the very greatest of all, the painter so grasped his subject that he projected it upon his canvas, untinged by his own personality. By the admirable skill, the art which conceals art, you may recognise the master; or, again, you may refer the portrait to one or two possible authors, but you can detect no treacherous mannerism, either of conception or of execution. This is eminently the case with the works of Titian. A judge may come to the conclusion that a given portrait can be by no other painter, because he can think of none who would rival it, but he might fail to be able to point out any distinct trait of the great Venetian. Thus the portrait of Julius II., in our National Gallery, by Raffaelle, a well-known picture, repeatedly reproduced by the artist, might have been thought to be a work of Titian, if the history of the case had admitted of such an illustration. It may, indeed, be the case with reference to the portrait of the Pope, that the fiery character of the man so dominated the ordinary temperament of the painter, as to lead to the production of a picture of a peculiar style. But, speaking from memory, there is a portrait of Paul III., painted by Titian, which was in Lord Northwick's collection, which might well pass for a pendant to that of his successor to which we have referred. With Vandyck, again, there is a variety in his finest portraits far greater than that which can be found in his Holy Families, saints, or other ideal compositions.

It follows from this view of the case that the characteristic style by which a painter may be almost certainly detected, by an accomplished critic, is something which is rather a defect than a virtue, and results from the limitation of the range of his ideas, the variety of his models, and the mastership of the procedures of his art. It is impossible to compare a number of paintings by the same artist without admitting that such is, to a certain extent, the case. Even in cases of very high, if not of the highest excellence, the poverty of the human imitator becomes evident when we compare it with the rich variety of nature. In landscape, indeed, it might be supposed that nature would so fill and dominate the artist, that he would cease to originate, and would be content to reproduce. And so, no doubt, he thinks to do. But in his reproduction are ever present the two invariable elements of his taste and his method, or, at least, the special bent of his skill, when he attempts different methods.

Thus, Constable, Crowe, Birket Foster, Vicat Cole, to go no further than our own galleries, would each so represent the same scene that we should readily recognise from which easel it was brought. If we extend our limits, and compare a landscape by Claude with one by Salvator Rosa, or one by Doré with one by Turner, it will at once become evident how powerfully the idiosyncrasy of the artist is reflected in his delineation of nature. It would be a study worthy of the best care of the critic to ascertain, and to define in one or two appropriate words, the chief element of personal character in works of art. Thus, the landscape of Hobbema may be characterised by one word—limpidity. The knotted branches of the trees in his work not only cyrve and bend with all the wild grace of nature herself, but their delineation seems to have floated from the brush. At times the artist is to be known by the mastery over, or the passion for, certain branches of his art. Thus we recognise Correggio by his magic chiaroscuro, combined with a skill in draughtsmanship that delights in what is most difficult to represent. In Rembrandt we have a chiaroscuro that is no less masterly than that of Correggio, but a taste that revels in effects of altogether a different tone. The broad Dutch build of the models of this artist is ever conspicuous, and at times is such as to pass the limits of good drawing. Again, in the great Venetian artists we are most struck by their sense of colour. The more the tell-tale characteristic of an artist is of a lofty and ideal character, as in the case of Raffaelle and of Leonardo da Vinci, the higher is the grade in art. The more it partakes of sameness of conception or of truth of manner, the lower is the merit. As in the maxim *Summa ars est celare artem*, so is the highest character of an artist that which it is most difficult to define, and most impossible to imitate.

In character, regarded as impressed on a work of art by the material in which it is executed, we have a different subject of inquiry, and one as to which it is important that every student should make himself at home. It is connected with what we may call the personal character of a production in this natural and direct mode. Every artist, almost, if not altogether without exception, has his favourite or special medium. He may be able, indeed, to work in several or in many, to paint and to sculpture, to mould or to draw; but there will almost always be one method of production in which he will be most excellent. In that case, the material, or medium, will harmonise in its behaviour under the brush or the chisel with the special mode in which the artist most freely works, and the result will thus be characterised by a sort of intensified, or doubled, personality.

We may refer to wood as an art material which, more than many others, prescribes to the artist the character of his work. The soft and yielding nature of wood requires a certain breadth and boldness of touch, in the absence of which we have, not wood-carving, but upholstery. Mechanical means give a unity and finish of surface to wood which is excellent in its own place, but which, if called in to cover the imperfections of the carver, is simply odious. A wainscot-board, or a door, fresh from the plane, has a beauty of its own, consisting in exactitude and mechanical finish. But if we would adorn, let us say, a chimney-piece with fruit, foliage, or arabesque, the plane, the file, and the sand-paper become very dangerous implements. The true tool for wood is the chisel, and the chisel not used as a knife, but struck by the hammer. Hammer-wrought wood-carving, even if rough, has a certain form and breadth of a very high artistic value. In the finer details of work, such as the veins and the serrature of leaves, or even the limbs and hair of children, the true wood-carver never loses the essentially sculptural touch. But the inferior workman, unable to carry out the idea of the work by a blow, or a series of blows, uses his chisel to pare, adds the service of the file, and smooths all the life out of his work. If the material be ivory instead of wood,

the method of execution is very different. The chisel can then only be used with extreme care; and that for the sake of saving time, and not, as in the case of wood, as the effective and proper tool. For the hard and elastic material readily shivers under a blow, and unsightly black cracks are thus originated—hardly perceptible when the work is finished, but steadily increasing, probably by the growth of microscopic fungi, and seaming the surface with destructive blemishes. Again, the grain of ivory, while much finer than that of wood, is more tyrannical. It compels a certain method of treatment, and a certain degree, not only of finish, but of finish which must be produced by strokes given in a certain direction. Ivory agrees with wood in having the effect of any work executed in it destroyed by mechanical finish. That is one main reason why the work, which is now executed by Fentum and other carvers, has not taken a higher rank in art. Ivory has an extraordinary tendency to form facets under the chisel or the burin, and these facets must be removed. The readiest way to do this is by the use of simple mechanical means. True artistic finish, in this material, consumes so great an amount of time after the work is apparently finished or all but finished, as to be entirely out of the question when price is at all an object. For this reason one of the most exquisite materials which nature has placed at the disposal of art has scarcely ever been worthily employed. Pure in colour, of a texture equal to that of onyx, and superior to that of alabaster, a perfect work in ivory has but one weak point, its comparative perishability. It requires to be kept from damp, from dust, and from darkness. It is easier to find carvers in wood to rival Grinling Gibbons, than carvers in ivory to equal Il Fiammingo.

Still directing our attention to plastic art, as that in which the character of the material employed by the artist is at once most varied and most pronounced, let us glance at the difference between clay and wax, as affecting the work of the modeller. It is well known to any one who has ever made essay of the modelling tool, how very different is the effect which the same amount of labour will produce in these two materials. The student instinctively would select one for works of a large size, or of a bold character, and the other for those requiring miniature delicacy of finish. For a rugged head of Jupiter or of Hercules the first would be appropriate, the second for the grace of a Psyche. Now we are told by Winkelman that the Greek sculptors modelled in wax; and, indeed, the name of the sculptor of Sicyon, who first employed clay, is recorded. In this there must be an error, arising from the want of practical acquaintance on the part of the critic with the work of the sculptor. We have to inquire for what purpose the model was required. If it was for a sketch, or first outline of a conception, whether on a reduced size, or on a full scale, there can be no doubt that clay would not only be the most cheap, ready, and effective material for the sculptor, but that, from the evidence of the early antiquity of the art of the potter, modelling in clay must long have preceded modelling in wax. But for a statue to be cast in bronze, the case is altogether different. For that purpose wax was by far the most manageable material for the artist. It could be melted by a moderate heat, and would leave the matrix ready for the metal. The use of a clay core or model for a metal casting implies a more advanced state of art than the employment of a readily fusible material for that purpose. Now it is certain that the exquisite modelling of some of the finest Greek statues, more especially male figures, is such as very closely to resemble the delicacy of a wax model. At times this lovely modelling is absent, as in the trunk of the Belvidere Apollo. It is possible that this magnificent but unequal statue is a copy of a nobler original. But the grandeur of the head is opposed to that view. Again, the breadth and freedom of the drapery are strongly suggestive of the use of the true sketching material of the sculptor. If the Apollo was executed from a clay model, while works of more tenderly accentuated surface, such as the torso of Cupid in the Vatican, were copied from bronze figures, or from wax models designed for the work of the metallurgist, these anomalies might be more readily explained. The proportions of the Apollo are too exact to allow us to suppose that the statue is a Roman copy of a Greek work. Roman copyists, so far as our experience goes, were never precise in their adoption of those definite laws of proportional girth which a modern writer on symmetry has shown to have been scrupulously obeyed by the great Greek sculptors. If the original Apollo was not intended to be a bronze, but a marble, statue, and was therefore modelled, not in wax, but in clay, the discrepancy between the grandeur of the head and the breadth of the drapery, on the one hand, and the comparatively rude modelling of the trunk, and want of exact symmetry in the limbs, on the other, may be readily explained.

The Apollo is a happy instance of the double signification of the term "character." We can, for instance, pronounce with certitude that the statue in the Vatican is not the work of Praxiteles. But whether it be owing to the special bent of the genius of the sculptor, or to the impress given to his work by the material on which he wrought, that we form our opinion, it is now hard to say. Thus, when an artist confines his operation to the medium most akin to the bent of his mind, and to the natural breadth or delicacy of his work, we have the result which, in a double sense, may be truly called characteristic.

THE NORTHAMPTONSHIRE EXCURSION.

On Monday morning, the 19th, were gathered at the rambling, roomy, old-fashioned George Inn, at Stamford, a party of some forty architects, mostly of the "younger persuasion" (as Artemus Ward might have put it), prepared for a week's sketching scramble among the churches of Northamptonshire, under the pleasant and trustworthy guidance (as on former similar expeditions) of Mr. E. Sharpe. The first day was occupied in sight-seeing and taking notes in the town of Stamford itself. With nothing so strikingly picturesque and antique as can be seen in Chester, Shrewsbury, and some others of our old towns, there is, nevertheless, about the streets of Stamford a quiet unobtrusive character and variety which is marked enough; gables and dormers break the line and come out from between the adjoining buildings, some higher, some lower, in a manner which is refreshing to eyes accustomed to the long dull lines of brick and horizontal cornice in our more modern towns; indeed, the sight of the low tiled building with its squat dormers, opposite the yard entrance of the inn, is enough at once to assure us that we have got away from the scurry of modern life for a little. The old life in Stamford must have been much brisker, though, when the place was one of the great coaching stages; now, the railway passes by the old town in a careless accidental manner, making it of little account; and, except for market-days, it would be difficult to guess how the large inns managed to keep it up, as in a lazy, easy-going way they seem to do.

A visit to

"Burleigh House, by Stamford town,"

(so Tennyson spells it, but it is "Burghley" here) formed the commencement of our inspections, by way of teaching the Gothic students what to avoid, perhaps. It is so consoling to see the smoke carried high above the roof, through classical columns, acting as flues, each couple carrying a small piece of architrave,—refreshing to the Gothic sense, too, to find the chapel marked externally by a spire, or something like it, a tribute to the "religious" prestige of Gothic architecture, combining, oddly enough, with the features of the Stuart period. It must be said, however, that this is the only incongruous feature in Burghley House, the rest being all quite in keeping, and some of the interior ornamental detail in the chapel and ante-chapel is really worthy of study and attention, as showing in the plaster diaper and the flat interlaced wood-carving a unity of effect and suitability to the materials employed with great beauty of execution.

As to the pictorial decorations, the walls and ceilings—

"Where sprawl the saints of Verrio and Laguerrre"

(for many of the rooms are painted by these two worthies),—they are fearful and wonderful indeed,—wonderful for the time and industry spent upon an art into which so little of mind went, and fearful from other causes. But Verrio ought to have been a good scene-painter. His power of making painted architectural features look real is not contemptible; and there must be conceded a certain boldness (or impudence?) of conception in his treatment of the great room, with Heaven (Verrio's Heaven, save the mark!) on the ceiling, and divers angels and others dropping therefrom, flying headlong from the cornice, and through the columns at the sides of the apartment. Then, on the staircase is Stothard's largest work, "Anthony and Cleopatra" (or "Intemperance"), far superior to Verrio, certainly, in refinement of conception and treatment, but marred by the artist's carelessness or want of study in drawing the figure, whereby his reputation, once supposed to give him a title to be called "the English Raffaelle," does continually fade and decrease as knowledge of these things extends,—a consideration not without its lesson to us all. Touching the paintings at Burghley, it is not here we are to speak. Some of them are valuable and well known; but the impression left by the decorative treatment is that one has seen legs and arms enough to satisfy one for a long time to come. The masses of trees in the park, heavy and dark in the strong sunlight, were a relief, indeed, to look at after all this display of tawdry pseudo-art.

Afternoon was occupied mainly about the Stamford churches, two of which, at least, are not to be despised,—St. Mary's and All Saints'; the tower of the first named being Early English, and a very fine specimen. The rest of the church is not remarkable, except for a fine richly-decorated canopied tomb of late date. All Saints' Church affords an instance of the advantage of designing in reference to site and approaches, for half the effect of this church is certainly owing to the fine and effective manner in which the tower, from its position, forms the background and culminating point of the composition as seen from the open square to the south of the church. In other respects this is a fine tower, though not equal to St. Mary's; and a highly-characteristic and individual feature in the external design is furnished by the wall arcading of lofty proportion and Early English date, which runs along the south wall, and forms the basement of the whole composition. It is unusual in Gothic work to find blank arcading occupying so much of the lower part of the wall usually devoted to windows, and carried out so continuously; and the breadth and solidity of expression thus gained might form a valuable hint for novelty of treatment in future buildings, ecclesiastical or secular. One of the most interesting buildings visited was Brown's Hospital, an almshouse or refuge providing accommodation for twelve aged persons, founded by one W. Brown, of happy memory, in the reign of Edward IV. This has recently been restored, and, in great measure, rebuilt, with additions, by Mr. Fowler, of Louth; and Mr. Sharpe bestowed decided and well-merited praise on the manner in which this had been effected, and especially on the care taken by the architect to leave incorporated, even in the rebuilt portions, enough of the old work to show clearly what had existed, and leave the architectural history of the building as little impaired as possible. The Dean of Stamford furnished some archæological particulars as to the history of the foundation, and Mr. Fowler, who accompanied the party, gave some further information on the architectural side of the question. The present dining-hall is on the space formerly occupied by the small cells of the inmates, with the ambulatory between, leading to the chapel, which retains its old situation, and is shut off from the dining-hall only by sliding doors and fine wooden screen. The lines of the tiling on the hall floor have been so arranged as to mark the places where the cell partitions once stood, so that the floor is thus made an indelible record of the former arrangement. The stone is of the neighbourhood, with Ancaster dressings, and the grey roofing tiles so common in the district; the combination of these, with the delicate warm buff tint of the stone, forms a singularly pleasant and quiet harmony of tint. Looking at the grassed sunlit quadrangle, with these homelike-looking buildings surrounding it, those who had seen the Royal Academy this year could hardly escape an association with that other "Harbour of Refuge," which attracted so much attention; but the architecture, one is bound to add, is better than that of Mr. Walker's painting. In the audit-room above the dining-room, are to be seen some of the most beautiful bits of old stained glass that we have ever come across. Especially was to be noticed the delicate and beautiful execution of the heads, the hair, and beards etched on in thin lines, with the utmost lightness and transparency of effect. In St. John's Church is the memorial brass of the founder of the almshouses; the church, though with very good points, is not otherwise

specially noticeable, except it be for some spotty wall colouring in the chancel, in the present haphazard accidental style. St. George's, a poor little church, claims a word for the singular shape of the tower, oblong on plan (the longer axis north and south), and battering in the upper stage; another word, too, in recognition of a monument to Sir R. Cust, by Bacon; a female figure, life-size, with elegant pose, and remarkably effective handling of the drapery, leaning against an urn; a very good example of the work of a sculptor, in his day rated above, and in ours below his real merits. The font here, too, is worth attention for an unusual design, both simple and suitable. A walk of half a mile out of the town, along the course of the Welland, with long masses of wood in Burghley Park crowning the opposite bank, brings us to St. Leonard's chapel, now half dismantled, the existing portion being divided into a stable, &c. And here it is that we find the finest piece of architecture seen throughout the day, the beautified west front, of the finest type of early transitional work, with its noble recessed central portal of four orders, executed in that grey oolitic stone which is found often hard and sharp in buildings of this date, while edifices in the more perishable sandstones three centuries later have decayed beyond recognition. The party were detained long before this beautiful specimen of ancient architecture, and so home to dinner, "with what appetite we may," which happened to be a very good one. After dinner came some remarks from Mr. Sharpe, specially intended mostly for the benefit of the younger members of his flock, the "students" *par excellence*, and those who were not present at previous excursions; not, however, without observations having a wider tendency and bearing. After this nothing better could be wished for than a stroll up the street, to see St. Mary's tower transfigured under a cloudless moon, with a grey lustre on the broad surface of stone and black impenetrable shadow in the recesses, unless it were to lean over the bridge where the river rippled quietly in the moonlight, and study the dark reflections of the buildings and poplars on each side of the water. By daylight, it should be remarked, the view from this bridge either way is most picturesque, in a quiet way, in the irregular arrangement of the buildings on its banks; and might well attract the notice of one or other of our water-colour artists.

On the morning of Tuesday, the 20th, we set off early in carriages, after the old fashion, to go round some of the churches near Stamford. Of those thus visited, Offington, with its neat well-kept churchyard, full of trees and shrubs, was the first: a small church of early transitional period; in general style and design quite a model for a small country church. Though we are specially on a Gothic expedition, we must give one word, however, to the gates and gate-pieces of the churchyard, and the larger and more elaborate gates, in the same style, of the grounds of a mansion opposite. These are in the English Renaissance style—what may be called the Jones period (or the ironwork may be later), and as good and admirable in their way as anything in the church. Tallington, a very small church not originally in our programme, need not detain us longer than just to record the existence of some bits of Norman work of some interest, and a good little transitional piscina, the headstone of which is formed by the sink-stone or cill of a former piscina, the inverted hollow of the old basin being visible on looking into the recess. West Deeping is, like Offington, a model village church, but in the Geometrical style, with a tower and spire of the Perpendicular period—short, but remarkably well-proportioned and pleasing in composition. Adjoining this is a large new parsonage, in the most violent contrast of "patent compressed" red and black brick, with tuck-pointed joints. A stronger lesson on the value of tone in building material, and especially of having the tone naturally belonging to the district, could hardly be given than by the contrast between this staring abortion and the cool subdued grey tone of the church opposite. And throughout this district it is to be noticed how pleasing to the eye is the stone mostly used for ordinary building, and how thoroughly the constructors of these buildings have known how to use it. So picturesque is the arrangement of the masonry, that even the stone fence-walls of the fields and farms, with their thin courses of masonry, and delicately shadowed joints, innocent of pointing, are a source of pleasure to the eye; and our party saw few pieces of work better and more truly architectural in its way than the park wall at Burghley, and some of the farm walls we passed in our drives. The system of coping most prevalent in the more carefully constructed walls of the district is so picturesque and effective as to be worth mentioning. It consists, over the ordinary masonry, of three or four courses of tiles, or very thin stones, each one set a little back from the one under it, and the whole crowned by a coping of semicircular bricks. One is surprised, at first, at noticing that all the stone-built cottages have brick chimney-stacks; but the stone, of course, is mostly lime-stone, and will not stand heat. A little bit of ornamentation seen in many of the roadside cottages is singular enough: the small gabled dormers have, as a finish, just under the apex, a crown-glass bull's-eye imbedded in the plaster or mortar. Some of our modern Goths are fond of using bull's-eyes in windows: here is another hint for them. But we must get on to the two Deepings; whereof the first, Market Deeping, is not a very remarkable church, but containing in the nave very good arcades, of different dates. St. James Deeping, on the contrary, is a very remarkable church indeed, both for beauty and peculiarity. The original church was part of a priory, founded in the reign of Henry II., and was evidently a church of three aisles, on the ordinary plan, and of unusual character. In its present condition, it offers the remarkable and unusual appearance of a church of two broad aisles of equal width, with a grand arcade up the centre. This is the south arcade of the original nave, the north arcade of which is replaced by a wall and lofty windows of the Perpendicular period; though a portion of the two eastern bays of the arcade is visible, built up in the later work. This north wall has settled and fallen outwards at least 18 in. out of the perpendicular, and so remains. In the centre wall, above the main arcade, is a remarkably fine triforium gallery, of late transitional date, originally forming the clearstory of the former church, the places where the windows were pierced being visible; but, now built up, as the new north aisle, of the Perpendicular period, is the same height as the other. The imposts of the main arcade present a most extraordinary and puzzling appearance, having, as the crowning member, the circular abacus, square on section, characteristic of late Transitional work, while beneath this the capital is arranged on the rectangular projections belonging to earlier work, and which, in such cases, the abacus usually follows. The appearance is, at first, as if pieces of an older capital had been worked up; but the fact that the member immediately below the circular abacus is in each case rounded to fit the curve of the latter, seems to indicate that the two parts were designed for the situation they occupy. If so, a more odd instance of the confusion of style and manner through which Gothic architecture passed, in its struggle through the experimental Transition period, probably does not exist. The chancel contains some beautiful purely Early English work, and the exterior treatment of the north wall, both as to windows and buttresses, is remarkably fine, and unusual in manner, for English work. Altogether, St. James Deeping is a church to afford much, both for pleasure and instruction in the higher forms of architectural expression. The village cross at this place also should not escape notice.

Northborough, the next on the route, is also a highly interesting church, not in its main structure, but in regard to the noble and massive architecture of the south chapel, added in the Decorated period, and as notable for its beauty as for its individuality of treatment. Still more interesting is the old house and outbuildings a little way from the church; the portion towards the road, with its fine archway, long roofs and dormers, and small mullioned windows inserted in the most desirable of masonry, should really be looked after by Mr. Boyce, whose masterly works in the Society of Watercolours' Exhibition have shown such a genius for handling this class of subject: he could make a very fine thing of it. We go from hence to Elton; the fine tower and spire of which, and the admirable and interesting detail, showing the transition from the Early English to the Decorated period, have been amply illustrated in published works. Helpston is a church of considerable interest and individuality, having an octagonal west tower with a small stunted spirelet by way of a finish, of the Late Decorated period. This is in reality old work, but has all been taken down and rebuilt, on account of failure of some portions, within the last three or four years, and so carefully and judiciously has this been done, under the superintendence of Mr. Browning, architect, of Stamford, that there is really nothing to show, externally at least, that the tower has ever been meddled with. There are some remains of very good ancient tiling in the chancel floor, and two very singular bench-ends of stone, carved with grotesques, but almost exactly resembling what we are accustomed to see executed in wood in such a position. In taking down the tower, it was discovered that a good many tombstones had been used in the masonry, or stones shaped as tombstones; whether they had actually fulfilled that office before being converted into building stone cannot be ascertained. Bainton is a small church in very bad repair, with an exceedingly good tower and spire, with the mullions of the lucarnes broken away, so that an unseemly amount of daylight is seen through the spire. The most notable thing in the interior is a very pleasing memorial bas-relief, a single figure, by Westmacott: curious enough to meet this highly-wrought little specimen of modern art in the midst of the piled-up masonry and grotesque carving of the Gothic period, and in so primitive a little village as Bainton,—it seems to belong to another world. There is a good font, Early English, in the church. We finish up our day's circuit with Barnack, where, indeed, some of us wished we had come in the morning and remained all day. The nature of the main interest attaching to this remarkable church is pretty well known, and the Saxon tower has been engraved a good many times; but we question whether those who only know it by such means have a correct notion of the scale and mass of this tower, most of the published engravings being small and paltry, and the style of the architecture being very misleading as to scale, on paper. We do not know whether attention has been so much directed to the remarkable proportions of the nave arcade, especially on the north side (early transitional), which is carried by circular columns, not short and massive as we are accustomed to find them, but with a tenuity of proportion more like that of late Perpendicular work, and carrying great circular arches of so wide a span that the nave, though no small one, is included in three bays. The south arcade is considerably later, with excellent specimens of the beautiful stiff foliated carving of the later transition: and singular it is to contemplate the three types of capital collected together at the west end of the church; on the north the early transitional, with the square abacus and projections on each face, and still retaining the impress of Norman work; on the south, the circular abacus with its elegant foliage; and between these the so-called Saxon arch carrying the tower, with its strange abnormal ploughings and furrowings in the stone, scarcely to be called mouldings, and producing on the fancy much the same effect as the contemplation of the bones of some misshapen extinct animal existing in a pre-historic period. What were the lives, what the notions concerning beauty and ugliness, of the men who have left us this strange travestie of architecture? We cannot get hold of this: we have before us the very stones on which they worked their fancies, almost as sharp and uninjured as if they had been put there only last year; and as to the men who did it, we can come no nearer than a conjectural belief that they were either Saxons or Danes,—words which to most of us are mere names in themselves. One thing, however, we are sure of, that the men who left us this memorial of themselves were not a very kindly or affable race; for no stories of harsh semi-savage life could seem much out of keeping with the expression of these silent records, so intimately are artistic feeling and moral and mental temper connected.

The Proposed New Park for Ashton.—The committee have awarded the first prize, of 20*l.*, for the best plan for laying out the Highfield estate as a public park for Ashton-under-Lyne and neighbourhood, to Mr. Alfred Lindley. The second prize, 10*l.*, has been adjudged to Mr. G. Gill, Stalybridge. Great preparations are being made to secure the success of the show about to be held on the grounds. There is every prospect of an early laying out of the ground. The sum already collected amounts to about 7,000*l.*, and no doubt is entertained as to the promoters obtaining the additional 3,000*l.* necessary.

NAMING.

Of course no one will insist on our endorsing all the complaints in the following communication. Any one custom in such a matter, too uniformly insisted upon, would no doubt give less pleasure on the whole than results from the use of fresh judgment in each case, and even from caprice, often the outcome of every way admirable instinctive feeling,—a better guide in delicate matters of taste than the coolest judgment. We, however, admit Mr. Pictorvaccæ's letter, though somewhat exceeding the space usually at command for the exposition of personal views, as it may lead to a proper confidence on some occasions where it would be usefully shown, and as the writer expostulates so good-humouredly with "his tyrants."

Sir,—Physiognomists, phrenologists, recognised character readers, and other professors of human nature, treat, in the ordinary way of their professional occupations, of the qualities of the vile bodies submitted to their masterly analysis. They cannot, of course, do without eagle glances and quickly-formed conclusions; and one does not grudge them any of the glory pertaining thereto: who ever does envy or even underestimate the acts of his confessed superior? To what good purpose do cynics suggest that every such Sidrophel does his task more cleverly, if the sufferers are first interviewed by a Ralpho who, in the way of duty,

"seeks out
"And pumps 'em what they come about?"

Some people may, indeed, account thus for occasional surprises to patients and their friends, or for a want of correspondence with previous notions about well-known things or persons. Happily few of us are of that mind; the most being rather disposed in such event to augment their reverence, if only the operator sticks firmly to his tale; for has he not in such cases expounded what was previously unknown, and might but for his prestige and confidence have ever remained so?

Similarly the activities of funambulists, fortune-tellers, conjurors, prestidigitators, improvisators, and other like ready-witted or lissome-bodied products of more (or less) civilisation, shall never find in me a depreciator nor snarling critic. Yet notwithstanding all this reverence and open-mouthed admiration,—notwithstanding a healthy willingness to achieve distinction or even worthy notoriety,—I have attained self-knowledge enough to readily confess that I am not anxious to exchange lots and depend for life on the sudden exertion of many supple muscles of brain or body.

Consider such accidents as failure of memory, as unagile wit—not to speak of undispelled ignorance! Why, then—confessedly liable to such ills of flesh—am I nonchalantly puzzled by painters and sculptors (and architects, too, I suppose are to blame), with mysteries more mysterious than mere ozokerits and agony columns,—to riddles readable, if at all, like Nostradamian and other prophecies, only by ingenuity most astonishing even to the interpreter himself? Why am I (and I suppose my experiences are shared by other lookers at art works) tortured by problems as distressing as ever racked the brain of a possible schoolboy—unknown to Macaulay,—in the shape of artfully draped queries hiding wild beasts of quadratics, or Sisyphean labours in deducing the present longitude of the schooner *Hum* from meagre data as to the personal history and state of the razors of her captain?

Why, in thirty-six words,—so that the patient reader may not in despair cease to listen for my grievance,—why are not the anathemas commonly pronounced against books without pronounceable and happy titles, and against books without indexes,—pronounced also against medallions, busts, statues and groups, pictures and portraits, public buildings and monuments without NAMES?

The walls of my church have recently been decorated in tempera, in the best and most workmanlike manner, with the counterfeit presentments of (for the most part) venerable gentlemen in costly raiment. Here, however, all cavil is put out of the question. We are not content with the illumination afforded to the happy initiated by the emblems thrust into some hands and held loosely; and, for the sake of variety and character, clung to desperately by others, in order to restore balance to their dislocated martyred frames. These are supplemented throughout by labels,—scrolls, we call them, as they are elevational perspectives of doubled (not rolled) strips of paper. And these are all inscribed as legibly as a writing-master's flourished frontispiece, or the grand starting-word of a bit of black letter. Can any one be astonished that the memory of this makes me indignant, when completely floored by the terrible child to whom I am explaining some unticketed modern masterpieces in stained-glass,—his untutored mind leading his eyes, not to the features, or the Tyrian purple robes, but to the wonderful saw which has strayed from a museum into the figure's left hand; and this because I had foolishly forgotten the elaborate iconographical chart constructed with so much care and pains, and condensed for portability into the size of a Murray's "London." Not thus unfairly were spectators treated by the mosaic workers at Monreale or St. Sophia. They, though regrettably ignorant of English, and using characters to be found in no well-printed newspaper, seem to have done their best to give fair verbal descriptions of their works; albeit, if we are to believe the Abbé Gravina, Salzenburg, and Texier, they indulged in a too uniform imitation of the vertical and erratic fashions of advertising tailors.

Do not let me be misunderstood as hinting that all pictures should be legibly labelled. No one would wish, for instance, that, in the great galleries of show-houses, the interpreting functions of the housekeeper or her handmaids should be in anywise superseded; especially when carefully made hand-charts of the pictures, that were correct when made, are to be found in every room. And the most perverse person would willingly forgive the Royal Academy for declining so heroic a task; seeing that, in that case, the rates of admission would of course have to be raised. It might, indeed, be objected that catalogues, even then, might possibly find a sale; but one knows that, in practice, the purchasing ceremony would be perversely omitted in too many cases,—with the additional evil consequence that visitors would be deprived of such ample memorial as they added to their stores in the last ("La Reine," of Vandyck) old master's catalogue. On the other hand, it would obviously be good policy to make it penal for print-sellers to exhibit in their windows prints before letters, etchings, or old engravings, without explanatory notices; and photographers or photo-sellers should be liable, at least, to forfeitures to respectable persons (claiming in proper form) if they omit to name legibly the portraits of eminent persons exposed for public observation and purchase.*

Sculptors, also, are often the most merciless of my tyrants.

"Under hanging mountains,
Beside the falls of fountains,"

seated in pleasant gardens, by laurel hedges, the subject of a marble group, seen against the trees of the autumn, may form a tolerable subject for fanciful conjecture. Even here one craves the conviction that by custom there shall be a concealed name-bearing medallion discoverable by the initiated; but in a gallery to detect the special nature of each of these white-robed divinities, with their uniform perfect calm of soul! . . . . The good Egyptian channelled and blacked letters of a name,—with a "*sculps.*" or "*fec.*" after it, as a condescention to high art sentiments,—evidence one healthy habit; and perhaps, in candour, the present custom of accompanying the Latin or Greek testimony to departed merit or to the existence of moral sentiment by the English original, ought not to be without its share of commendation. . . . . I wish, indeed, that this habit of sculptors could be considered to justify an architect's name-medallion or panel,—say on the eye-line in every modern building; or, if in the absence of special precedent the innovation should be deemed all-too-violent, the allegorical fashion of Batrachus (frog) and Saurus (lizard) might be regarded with favour, as it has the prestige of many centuries; or initials; or rebus, after the punning fashion of I (or eye)-slip, Bolt-tun, Ram-ridge, Wheat-hampstead (*locus frumentarius*), or *before* it if wit or fate (which, after all, has some share in a name), will allow. . . . . .

An inspection of a large, new, City-of-London building, not yet manifested internally to the vulgar world, affords me some very pertinent instances of the sort of anonymity I am deprecating. It has a big central nave, from which the recessed side chapels for study open by goodly ranges of pier-aches, and in the spandrels between these arches are carved heads of poets, other writers, architects, sculptors, painters, and what (*pace* of Mr. Gladstone and Mr. Ayrton) will probably always be known as men of science. Of course, these have all been copied from the best authorities, carefully modelled, and skilfully carved. I did, it is true, fancy that Shakspeare showed, what I called to myself, the conventional ideal, instead of either the homely sagacity of the Stratford bust, or the poetic elevation of the Chandos portrait. Also (as, for instance, in his case, and Michelangelo's, and Wren's) I fancied,—as, in fact, I often do elsewhere,—that my diminutive stature (under 6 ft.) unfitted me for seeing the works so fairly as I should have done before they were hoisted aloft; but this latter objection would, of course, lose its validity when the contemplated increase of physical dimension,—corresponding with the future intellectual height,—has been attained; and, indeed, in that still atmosphere, full of the (much diluted, let us hope) fragrances of Russia and vellum, with rows of Grainger, Lodge, and their congeners, and bulbous portfolios, with loose engravings by the thousand, placidly awaiting observers. Amid such company it might well bring a blush of shame to the cheek of an ingenuous, able-bodied, strong-wristed frequenter, if compelled to confess that any one of these faces was wholly unfamiliar, or anything short of perfectly identified at a first glance. Nevertheless, a stranger or occasional visitor of the existing dwarf humanity,—a weak-limbed innocent, to whose pithless arms heroic grappling with many folios would be a task,—a born forgetter of faces with his untrainable eye,—might not these and others have their possible existence recognised, or not ignored? Would it not seem, in fact, that the few days which an alphabet-cutter would need to bestow on simple halos of letters might be a pleasing economy of human labour in the long-run?

I must, indeed, forbear to say positively that there would be a similar obvious advantage in pointing out in a readable way the companies,—from which the rampant animals have strayed, that stand guard at higher levels in this building over the corbels, lending support to the roof-tree. "Such ugly monstrous shapes elsewher may no man reed." Some may imagine that this menagerie consists in seriousness of poetic conceptions, — Spenser-like warnings of possible transformations due to extreme devotion to apician frenzies, appropriate here, as this hall is to serve as vestibule to the grand temple of that *cultus*,—

"Rearing fercely their upstaring crests.
* * * * * *
Sad end . . . . .
And mourneful meed of joyes delicious!"
(*Book* II., *Canto* 12.)

We may thus conclude that some allegories might usefully be left to the interpretation of individual wit; but the omission of all legend round the numerous shields hereabouts seems not so well justified on similar grounds. Between the savage mockery of Lord Macaulay and the continuous exulting pæan of an amateur herald, there must be in the country at large many gradations of sentiment;—one is, in truth, sometimes inclined to think that, as in many other things, a good deal of the variation in sentiment is due to the variation in degrees of ignorance. Letting that be as it may, many people (not, of course, everybody) would still maintain that carefully devised and arranged and carved shields, and indeed heraldry generally, might gain (as well as the onlookers) if some distinct idea were necessarily associated with the more or less graceful forms. A notion of this sort seems times and again to have occurred to actual builders, and as a consequence names and dates have been put on the grounds of the panels occupied by shields. But why should these freaks of subtle genius be so rare? Why should not,—in consideration here also of

* We are forced, by considerations of space, to omit Mr. P.'s remarks on painters' signatures, dated works, warranties, the identification of portraits, the Gainsborough and Reynolds portraits of unknown ladies (4 and 5 in the Bethnal-green collection) pointing the moral; also on enigmatical titles, the difficulties of nomenclature illustrated by the experience of Nathaniel Hawthorne, in the matter of "transformation,"—omitted in order not to imperil the authenticity of the communication, having in mind the experience of Dr. Livingstone, &c. From other practical suggestions, the following may, however, be selected:—"In the national collections of pictures (for instance, at South Kensington), the dates of the deaths of painters should be filled in to the spaces prepared for them. Perhaps it might be better to omit the "D" till the year can also be supplied: otherwise, an extreme longevity is in some cases suggested for artists, that must be dubious, even to people not possessed of the systematic incredulity of Mr. Thoms. If the date, or even the approximate date, of the execution of a painting could be supplied, it would very frequently be valuable: this has been done,—'painted about,'—on different occasions."

human frailty,—every arms-bearing shield (and perhaps, after all, they are better than the blank ones that years ago seemed likely to become fashionable) be accompanied, as a matter of course, by the name of the lord who bears it (as his seal)? On occasion, why should not the quarterings be explained, in all the commonplace of readily decipherable inscription, thus:—

Jones | Robinson
James Jones,
Member of the Committee,
A.D. 1888. ?

[Consider also the woes of future heralds, and the prodigious dimensions of a comprehensive Gwillim Edmondson, Burke, or Robson of the year 2000; unless it shall be agreed that named and single blazons shall not imperatively demand book perpetuation by the photo-chromo-instantaneous-printing of that period.]

I begin at this stage to fear that I have written myself into something like good temper and amity; and appear, in consequence, to find my grounds of grievance shifting away under me. In digging over the soil, I have seemingly made it less solid. My main personal complaint seems merely to be that guide-books, catalogues, and books of reference generally are sometimes big, occasionally of an awkward shape to carry, occasionally inaccurate, and frequently incomplete: not always at hand on a casual look into an exhibition, or at a public building or monument. Perhaps at any time one may be justified in repeating also the general complaint of the evil fate which, even in a real library, so often hides a wanted detail, and only yields it up as the reward of diligent hunting. On reflection, however, it becomes pretty evident that any one may, if he will take the trouble, provide himself with appropriate antidotes against a poisoned peace from these; except, indeed, in the last case,—of the revenge harboured in the frame of things,—which is beyond the reach of medicine. These antidotes would be in no wise outlandish or difficult to procure;—artificial memory, unlimited patience and industry, streams of shillings, pockets of great book-carrying capacity, and a sturdy muscular frame;—some strict limitation of subjects of interest. . . . .

This feeling of comparative indifference is, it may be, rendered all the more victorious by a sort of consciousness that so almost entirely virtuous and so prominent an example in these matters as the Prince Consort Memorial is likely to set a lasting fashion, and shortly prevent us (unless, indeed, we are forced thereby to turn our coats) from grumbling in the least at any but the works of an older time. Ideal groups and single figures all named; the portrait subjects also; sculptors' names boldly put;—in cases, indeed, with the extra attention of crows' feet and lines to indicate the limits of sculptural responsibility: "Queen Victoria and her people" have shown in all a fair fellow-feeling for the forgetful, unimaginative ordinary person. With the exception of names to arms, of which the omission is less wicked in this instance than ordinary, as their signification can hardly be misapprehended; barring also the want of a date or two to the portraits to make clear the chronological series,—though even this is not here indispensable, so obvious is the drift (and woe be to the man who would dare to date some of them with firmness); the name of the architect is also wanting above the recognisable low-relief profile, so inseparably connected with the monument. With these exceptions, the most vehement vindicator of the value of naming could not ask for a better specimen of the rational following out of his theories.

Not of course that one wants to convey the impression that the right thing has not been done elsewhere as well. Dulwich School, with its range of terra-cotta portrait medallions above the one-pair story, all answering to names on the hollows above them, is another happy case in point; notwithstanding that keen youthful eyes or an opera-glass may be almost necessary to read some of the inscriptions around, and discern some of the lineaments of these heads of world-famous story, their height above the lower world doubtless being a few feet too philosophical.

The London University building in Burlington Gardens—— But why indulge in a sort of catalogue?

Having thus shown that naming is important, and should be uniformly attended to, unless certain effective substitutes are obtainable, and that good judgment in some new instances will be sure to influence the future, it only remains for me to say that no professional jealousy actuates these criticisms, and to show that my works are most obviously not obnoxious to the complaints I have made against those of others by subscribing myself, sir,

Your obedient servant,
JOHANNES PICTORVACCÆ,

Dairyman's Landscape and Animal Artist; Still-Life and Animal Painter for Public-house Signs; Harlequins for Oils and Colours; Mangles;—also Lettering to the same, in every style.

THE STRAINS IN TRUSSES.*

THE system of exhibiting by means of diagrams the relative strains to which the several parts of a piece of framework are subjected when the whole is loaded with a weight, was propounded some few years ago by Professor Clerk Maxwell, but has not been used by engineers and architects to the extent that it deserves. The work before us will greatly aid those who are still unacquainted with the method, in applying it to various kinds of structures, such as trussed roofs and bridges. The author has, however, omitted all mention of Professor Maxwell as the author of the system, and any one taking up the subject for the first time might suppose that Mr. Ranken was himself the inventor of it, although he really makes no claim to be so, but only "to set in a clear light the theory and method of computing by diagrams the strains in trusses bearing a constant load," so that "it may be found intelligible even by those who have no previous knowledge of statics." In order to do this, he commences his treatise with an explanation of the mode in which forces are considered in statics, the principle of resultants and components, together with the parallelogram of forces in which the diagonal represents the resultant of the two forces forming adjacent sides of the parallelogram. The triangle of forces is a simple deduction from the preceding, or rather "another way of stating it." If three forces keep a point at rest, three straight lines drawn parallel to their directions will form a triangle whose sides, taken in order, will be proportional to the magnitude of the said forces. By this principle, if the direction of three forces and the magnitude of one of them are known, that of the other two can be at once determined by the simple process of drawing a triangle. When there are more than three forces to be considered, we can first find the resultant of any two, and combine it with another of the forces, and so on for any number. We can thus extend the principle to that which is called the polygon of forces, and which is stated as follows:—If any number of forces acting in one plane keep a point at rest, then straight lines drawn parallel to the directions of those forces, taken in order, will form a polygon whose sides will be proportional to the magnitudes of the forces. The author has omitted to demonstrate the steps by which the principles above enunciated can be reduced to the system of stress diagrams for triangular or polygonal trusses; but the following is a brief explanation of their connexion:—Suppose A, B, C, to be the joints of a triangular frame acted on by a force at each of those joints, which keep it in equilibrium; then, by the "triangle of forces," the lines representing these three forces must meet at some one point,—D,—and be proportional to the sides of another triangle,—P, Q, R,—which are respectively parallel to the lines A D, B D, C D. Then the stresses in the sides of the frame,—B C, &c.,—will be represented by lines drawn from P, Q, R, parallel to those sides, and meeting in a point,—X; the lines P X, Q X, R X, representing proportionally the strains in B C, C A, A B. If the figure A, B, C, represents the centre lines of the beams forming the truss or frame, it is called the frame diagram, and the figure P, Q, R, is the stress diagram.

After giving several examples of the balancing of three forces amongst themselves to familiarise the student with the method of forming diagrams, he proceeds with the application to the ordinary forms of roof trusses, beginning with the king-post truss, and proceeding with more elaborate combinations of framework. Taking 12 to represent the load sustained by each truss, he finds by means of the diagram what portion of that quantity is borne by each part, and whether the strain is tensile or compressive; he assumes, however, that if a continuous beam is loaded uniformly, and supported in the centre as well as at each end, the weight borne by the middle prop is twice the weight supported by each of the abutments, and when there are two equidistant props that each has one-third of the load to carry, the two abutments carrying the other third between them, and so on. This is not, however, the mode of dividing the load which is adopted by the latest writers on the subject, the proportions which they give being for one, two, or three intermediate props as follows:—

$\frac{3}{12}$, $\frac{5}{8}$, $\frac{3}{10}$,
$\frac{4}{10}$, $\frac{1}{10}$, $\frac{1}{10}$, $\frac{4}{10}$,
$\frac{11}{112}$, $\frac{32}{112}$, $\frac{26}{112}$, $\frac{32}{112}$, $\frac{11}{112}$.

In the examples given in the treatise the strain on the king or queen post from the weight of the tie-beam is omitted "for simplicity," but if there is a ceiling to be supported by the tie-beam this would produce one of the most important strains which the truss would have to bear, and ought not in any case to be neglected, the chief business of the king or queen post being to prevent the sagging of the tie-beam.

The effect of the wind is by far the most important of the strains which a roof-truss has to sustain, and this is taken by Mr. Ranken in all the examples as a dead weight acting equally on both sides of the roof at the same time; except, however, in roofs of very low pitch, this would lead to very inaccurate results, as the force of the wind is almost always sustained by one side much more than the other, so as to produce a racking strain upon the framework, to counteract which the timbers must be made much stronger than if they had only to sustain a uniform vertical weight acting on both sides alike. The stress diagrams ought, therefore, to be always drawn on the hypothesis of the wind being at right angles to one surface of the roof, and the figures will then have a very different appearance to those given by the author.

A considerable number of examples are fully worked out for the frameworks of girder bridges as well as of roofs, by mastering which the student will find that he has acquired great facility in the application of the principle to practical purposes without having to trouble himself about algebraical or trigonometrical formulas; these latter, however, cannot be dispensed with in considering trusses exposed to the action of a travelling load, as in railway bridges, to which this system of diagrams is hardly applicable. In applying the method to practical uses, care should always be taken to ascertain the exact mode in which the strains to be supported are applied, as otherwise very erroneous results will be obtained, by which the system may get into disrepute, whereas the mode of using it is really in fault.

The system of computing strains in trusses by means of diagrams has hitherto been too little known or practised by English engineers, and the present work, although not so accurate as might have been desired, will do good service for the profession by showing how easy it is in application after a little practice. We therefore strongly recommend all students of architecture and engineering to work out carefully the examples given in this treatise, as well as others which may arise in the course of their practice. They will by this means become familiarised with the relative strains which the several parts of a truss sustain, and be able to detect at once any weak points in its design.

* The Strains in Trusses computed by means of Diagrams. By F. A. Ranken, M.A. Longmans, London.

THE HARTLEPOOL EXCHANGE AND CLUB-HOUSE COMPETITION.

SOME three or four months since the directors of the projected exchange buildings at West Hartlepool invited twelve local architects to submit designs, and after deliberation the New Exchange Company have committed themselves to a definite scheme for the erection of a block of buildings, to be designated "The Hartlepool Exchange." The selected design is that bearing the motto, "On 'Change," the author of which is Mr. G. G. Hoskins, of Darlington.

The building will have three principal frontages. The style is Italian Gothic, having a tower, with angle turrets breaking the line of the north façade. The materials proposed to be used are red pressed bricks, relieved with stone dressings.

The Post-office authorities have had copies of the plans submitted to them, and probably the new post-office buildings, much needed for West Hartlepool, will form a separate department. The North-Eastern Banking Company are also in treaty with the directors for suitable accommodation here, and most of the offices in the

building are already secured, on promise, by private firms in the town.

The same architects also submitted designs for a club-house for the Exchange Company, to be erected on a site facing the Exchange, and in this case also Mr. Hoskins succeeded in carrying off the prize. The building is in the same style of architecture as the Exchange.

It is understood that the directors have assured themselves that both buildings can be carried out for the estimated cost, and operations are expected to commence without delay.

THE CONSTANT SERVICE OF WATER.

Sir,—During the past week very important regulations have been issued by the Board of Trade relative to the fittings required for a constant service of water under the provisions of the Metropolis Water Act, 1871, all of which are tolerably clear except the last (No. 33), which says:—"All existing fittings, which shall be sound and efficient, and are not required to be removed or altered under these regulations, shall be deemed to be prescribed fittings under the Metropolis Water Act, 1871." But, inasmuch as "these regulations" do not in any part require specifically any fittings to be removed or altered, I am at a loss to understand the meaning of the clause quoted. A careful perusal of the regulations, and a clear and succinct account of what is required of property owners under them, would repay a journal so largely devoted to sanitary science, and so widely read by property owners, more especially as in so complicated a matter the water companies will make every endeavour to stretch their powers to the utmost limit, and to withhold all possible information from the public.

Ball Valve.

WASTE IN WARMING.

At the meeting of the British Association which has been held with remarkable success in Brighton, Mr. Bramwell, C.E., as president of the Mechanical Science Section, dilated on coal and the means of obtaining power without coal. After speaking of the amount of coal left buried in abandoned mines, the speaker said,—Next there came the question of the waste of coal when brought to the surface. This was of two kinds, the domestic and the manufacturing. The domestic waste was a highly important branch of the subject. It is believed, said Mr. Bramwell, that out of the total of 98 or 99 millions of tons of coal which in 1869 were retained for home use, 18½ millions of tons, about one-fifth of that quantity, were consumed for domestic purposes. We all of us know so intimately the way in which coals are burnt for domestic purposes that it will seem an idle waste of time to describe it. We put a grate immediately below and within a chimney, and, as this chimney is formed of brickwork, by no possibility can more than the most minute amount of heat be communicated from the chimney to the room. On this grate we make an open fire. Fire cannot burn without air, and we provide no means whatever for the air to come in to the fire. This is a provision that not one architect or builder in a thousand dreams of making. The consequence is that the unhappy fire has, as it were, to struggle for existence. In a well-built house especially has it to struggle, for the doors and windows shut tightly. The result is that the fire is always smoking, or is on the verge of smoking. We breathe the noxious gases, and we spoil our furniture and pictures; nevertheless, happily for us, the fire does succeed in getting supplies of air which, even although insufficient for the wants of the chimney draught, do renew the air of the room. If, to satisfy the demands of the chimney, and to stop its smoking, a window is left a little open or a door is set ajar, we complain of draughts and we complain of the unhomely look caused by sitting in a room with an open door, so that there we are, with an asphyxiated fire, our smoky rooms, and our draughty rooms. Moreover, the fire being immediately below the chimney, the main part of the conducted heat inevitably goes up it and is wasted, leaving the room to be warmed principally, if not entirely, by the radiated heat; and we do and suffer all this in order that we may see the fire, and be able to poke it. I must confess that if there were no cure for the evils I have described other than the close stoves of the Continent, with the invisible fire and with the want of circulation of air in the room, I would rather put up with the whole of our present domestic discomforts, and even with the loss of heat, than resort to the close stove as a remedy. But there are modes by which freedom from smoke, freedom from draught, efficient ventilation, and utilisation of the heat may all be combined with the presence of the visible pokable fire. Some members of this Association may recollect the paper that was read before it at the Norwich meeting in 1868 by Captain Douglas Galton, in which he so clearly described his admirably simple invention of fire-grate. This consisted in putting a flue to the upper part of the fire-grate, which flue passed through a brick chamber formed in the ordinary chimney, which chamber was supplied with air from the exterior of the room by a proper channel, and then the air, after being heated in contact with the flue in the chamber, escaped into the room by openings near the ceiling, so that the room was supplied with a copious volume of warm fresh air, which did away with all tendency to draughts from the doors and windows, and, moreover, furnished an ample supply for the purposes of ventilation and combustion. These fireplaces, I regret to say, have been but little used in England, from a cause I shall have to advert to hereafter—a cause which, as I believe, stands in the way of adoption of improvement generally. The merits of these fireplaces were at once acknowledged by the French, who made the most careful and scientific investigation of their working; and they found that with such fireplaces three times the effect was obtained from a given weight of coal that could be got with those of the ordinary construction. No doubt there are many other plans by which the same end as that attained by Captain Galton may be arrived at, and yet we go on year after year building new houses, making no improvement, exposing ourselves to all the annoyances, and, worst of all, wasting the precious fuel. Assume that we were to set ourselves vigorously to work to cure this state of things, can it be doubted that in ten years' time we might halve the consumption per household, and do that not only without inflicting any discomfort, or depriving the householder of any gratification, but with an absolute addition to warmth and an increase of cleanliness, a benefit to health, and a saving of expense? Moreover, it must be remembered that, with the imperfect combustion of domestic fires, large volumes of smoke are poured into the air. We know how much freer from smoke town atmosphere is in summer time than it is in winter time, and this simply on account of the smaller quantity of coal that is being burnt. Suppose that we could reduce the total consumption, both in summer and in winter, by 50 per cent., what an enormous boon that would be even in the one matter of a pure atmosphere.

THE DIMINUTION OF ORIGINAL RESEARCH.

At the British Association meeting already referred to, Dr. Hall Gladstone, F.R.S., as president of the Chemical Science Section, drew attention to the diminished activity of chemical discovery, and to the lamentable fewness of original papers communicated. This has been attributed chiefly to the "non-recognition of experimental research by our universities," and suggests that in the granting of science-degrees every candidate should be required, as in Germany, to prove his ability for original investigation. Concurring in this, I would remark that other causes have also been assigned, and other suggestions have been made. There is the small recognition of original research even by our learned societies—at least, such recognition as will come home to the understanding of the general public. It is true the fellowship of the Royal Society is awarded mainly for original discoveries, and there are two or three medals to be disposed of annually; but these distinctions fall to the lot of the seniors in science, often men who are beyond the need of encouragement; and though they doubtless are serviceable as incentives, there is many a beginner in the honourable contest of discovery who is too modest even to hope for the blue ribbon of science. While the Victoria Cross is awarded to few, every soldier who has borne part in a victory expects his clasp; and so might every man who has won victory over the secrets of nature, fairly look for some public recognition. It has been suggested, for instance, that the Royal Society, in addition to the F.R.S., might institute an Associateship, with the letters A.R.S., designed exclusively for those younger men who have shown zeal and ability in original research, but whose discoveries have not been sufficient to entitle them already to the fellowship. It is suggested, too, that the Chemical Society might give some medal, or diploma, or some similar distinction to those who contribute papers of sufficient merit. But beyond this is the non-recognition of scientific research by society in general. We can scarcely expect the average enlightened Englishman to be anything but scared by a graphic formula, or a doubly sesquepedalian word containing two or three compound radicals; but he need not continue to talk of the four elements, or of acids being neutralised by sugar. But, indeed, the so-called educated classes in England are not only supremely ignorant of science, they have scarcely yet arrived at the first stage of improvement—the knowledge of their own ignorance. Then, again, there is the excessive preference of practical inventions over theoretical discoveries—or rather, perhaps, the inability to appreciate anything but tangible results. Thus, a new aniline compound is nothing unless it will dye a pretty colour; if we speak of the discovery of a new metal by the spectroscope, they simply ask, What is it useful for? and the rigorous determination of an atomic weight has for them no meaning, or interest, or beauty. The general appreciation of science must be of gradual growth; yet there are wealthy men who know its value, and who might well become the endowers of research. There are, indeed, at present, funds available for the purpose—such as the Government grant and the surplus funds of this association; but the money is given simply to cover actual outlay; and this, though very useful, scarcely meets the case of those young philosophers who have no balance at their bankers, and yet must live. Will not some of these wealthy men endow experimental scholarships, or professorships, in connexion with our colleges, institutions, or learned societies? As an instance of the good that may be effected in this way, may be cited the Fullerian professorships; and as a very recent example, worthy of all honour, may be mentioned the purpose of Mr. J. B. Lawes, not only to continue his elaborate experiments at Rothamsted throughout his lifetime, but to place his laboratory and experimental fields in trust, together with 100,000*l.*, so that investigations may be continued in the wider and more scientific questions which the progress of agriculture may suggest. The Government of our country, through the Science and Art Department, renders good assistance to the teaching of science; and if the recommendations of the Royal Commission on Scientific Instruction and the Advancement of Science be adopted, the introduction of practical examinations for the obtaining of certificates for a superior grade of science-master will certainly foster a spirit of research. I believe that this diminution of original research, which we deplore, is partly due to a cause in which we rejoice—the recent extension of science-teaching. The professorships of chemistry are scarcely more numerous now than they were twenty years ago, while the calls upon the professors' time in conducting classes or looking over examination papers, have greatly augmented. Thus some of the most capable men have been drawn away from the investigation of nature; and in order to afford sufficient leisure for the purpose, means must be found to multiply the number of the professorships in our various colleges. While the rudiments of science are being infused into our primary education, now happily becoming national, while physical science is gradually gaining a footing in our secondary and our large public schools, and while it is winning for itself an honoured place at our universities, it is to be hoped that many new investigators will arise, and that British chemists will not fall behind in the upward march of discovery, but will continue hand in hand with their Continental brethren thus to serve their own and future generations.

OF THE ACTION OF SEWER GASES UPON LEAD.

At this season of the year nothing is so painfully persistent, so obnoxious, and so patent to our observation as the intolerable smells which proceed from defective water-closets. The nuisance needs no special malediction from us, to any one who has given the least attention to the subject, or bestowed upon it the slightest scientific examination.

It is now generally allowed that much of the evil is due to defective soil-pipes; and on this topic we may say a few words explanatory.

Some time ago, as our readers will remember, Dr. Andrew Fergus drew attention to the very grave subject of the chemical action of sewer gases upon lead; and to the fatal consequences which often result from that somewhat recondite and unforeseen cause. It is hardly possible to overestimate its importance; and, indeed, we are rather surprised that the paper has provoked so little discussion hitherto. Of course this subject of the corroding and perforation of leaden soil-pipes through the chemical action of the sewer gases is, as our readers must know quite well, not new to us. We have long been aware of the evil; indeed, we have had painful experience of it in our professional practice. The disastrous circumstances attending a rotten soil-pipe are obvious; and we venture to assert that the evil is very much more widely distributed than most people are aware. Dr. Fergus deserves high commendation for his observations and researches; and we regard it as a most hopeful symptom of sanitary progress that intelligent physicians are every day becoming more alive to the evils which are wrought by defective construction.

The day is fast approaching when the physician will find it as necessary to examine, or, at least, cause to be examined, the house drains and the water-closet as regularly as he does his patient's pulse or the state of his tongue! What an important fact it must be, for example, to ascertain in a case of typhoid fever whether the soil-pipe communicates with a sewer or with a cesspool! How many cases of diarrhœa might be discovered to originate from the scandalous practice of connecting the waste-pipe of the cistern (having, of course, a close lid too) with the trap of the water-closet? We have known instances of a whole family of children being stricken down at one time with scarlatina in its very worst form in consequence of the nursery being placed in close contiguity to a foul and defective water-closet.

It may be alleged in such cases, with the highest probability, that the water-closet was imperfectly constructed, and it may easily be admitted that neither the water-closet itself nor the soil-pipe to which it was attached was made of good materials in the first instance, or properly fitted up in the second. Our whole building jurisprudence is unquestionably at fault in this matter, for it is absolutely left, as the law stands at present, at the option of any speculative proprietor, or any needy contractor, to do what seemeth just in his own eyes, in this most vital and important constructive detail.

The stoutest and best-made leaden soil-pipe in the world cannot long resist the action of sewer gas; and as supplementary to the statements already mentioned, we may briefly indicate how this curious yet dangerous consequence occurs. That which is popularly termed "sewer gas" consists in reality of a compound of different sorts of gases;—sulphuretted hydrogen, hydrosulphuret of ammonia, carburetted hydrogen, carbonic acid of course, and minute traces of certain other gases, including arsenietted hydrogen, when the sewer becomes impregnated, as it often does underground, with coal gas. Of these highly noxious and dangerous gases, the two first mentioned constitute the greatest bulk of the compound; and of those two again, sulphuretted hydrogen chiefly predominates. Now this abominable gas, which the merest tyro in chemistry must be acquainted with from its disagreeable odour—that is, simply of rotten eggs—has a well-known and specific action upon lead. Indeed, it is beyond all question the best analytical test for lead; a fact which signifies, in other words, the greatest chemical affinity. Although it occurs in nature associated with certain mineralogical groups, it is far more frequently produced by the decay and decomposition of organic substances, such as albumen, fibrine, caseine (*e.g.*, as in eggs, flesh, or cheese), and in the rest of the so-called proximate principles of organic chemistry. Almost all decayed animal and vegetable matters evolve this gas. Indeed, it would seem to be a wise and salutary provision of nature to make the process of decomposition in all its phases offensive, and these decomposed principles our readers will be at no loss to account for, some of them at least, in the substances which (always speaking collectively) we term *sewage*. The residuum of sewage is that which goes to make up the contents of all soil-pipes, cesspools, and cesspits, of whatsoever description or denomination. Few people who are not well read in organic chemistry understand what a quantity of sulphur is necessary to the waste and reproduction of the tissues; and still fewer, we are afraid, that this sulphur, wholesome in the highest degree, and indispensable to our nutrition, when it occurs in our food, becomes by an inscrutable law of nature a deadly poison. The truth is, that this poisonous gas simply dissolves the metal (lead) and perforates the tube which constitutes the soil-pipe, and finally escapes itself, mixed with all its infernal death-producing congeners, into our bedrooms, our drawing-rooms, and even our very dining-rooms. It may be added that this is done continuously,—under certain circumstances irresistibly,—but, above all things, silently and unseen. The whole of these sewer gases are colourless and invisible: however dangerous, however poisonous, they may be, they are always unseen and insidious. *It needs an acute and practical nostril*, for the most part, to detect them; and, in point of fact, in many instances, where the house is properly and systematically ventilated (especially during the day), it is almost impracticable to detect them at all, even by their vile and noxious smell. When it is added to these remarks, that hardly such a thing as a perfectly sound and complete system of sewerage, far less of house drainage, exists in any of our large towns, it will at once be seen what a dangerous and wide-spread public enemy we have to contend with.

PROPOSED LUNATIC ASYLUM, ST. ANN'S HEATH, VIRGINIA WATER.

We have already spoken of Mr. Holloway's intention to erect a lunatic asylum for the unsuccessful of the middle classes, and to present it to the country, and of the designs for the building that had been submitted to him in competition, under certain conditions. We published a view of the design to which the second premium was given,* and we now illustrate, by view and plan, the design sent in by Messrs. Crossland, Salomons, & Jones, to which the first premium has been awarded. In this design the architects have avoided the ordinary gallery system, their experience being, they say, that it does not conduce to the comfort or general management of the building; and in this matter medical men and general managers of asylums consulted have confirmed them. The general form of the building is such that all day-rooms, dormitories, and single rooms have a south and south-western aspect, and the mode of communication is by corridors 7 ft. wide.

The patients are classified as follows, on the male side:—

There are four classes,—first-class patients, second-class patients, sick and feeble, and excited patients, in the following proportions. The female side similarly arranged:—First-class patients, 35; second-class, 30; third-class, 15; fourth-class, 20.

The proportion of single rooms to each class is as follows:—

First-class:	6	single rooms;	29	in dormitories.
Second-class:	5	,,	25	,,
Third-class:	6	,,	9	,,
Fourth-class:	8	,,	12	,,

All the feeble patients are to be on the ground and first floors. Provision is also made for fever or contagious cases on the upper floor, with separate stairs, with dormitories for five or more beds, spare rooms, separate kitchens, &c., for nurses, with cubical contents in dormitories of from 1,600 ft. to 2,000 ft. for each patient. The floors of these rooms are to be of oak, with fireproof arching. The attendants are placed between the day-rooms and dormitories, with a glass window or doors of communication, and so arranged as to afford the means of overlooking the patients. There is also a bedroom for the night attendant in a quiet portion of the building, where he can sleep during the day. Extra rooms, both for attendants and patients, are provided on each side of the buildings. The associated bedrooms, as will be seen on the plans, are so constructed as not to contain less than four or more than ten, and all under the supervision of the several attendants.

All exuberance of ornament and expensive detail is avoided, and it is sought to obtain an effective building by a judicious arrangement of parts. The buildings are to be of red bricks, with stone arches and string-courses, small turrets carried up over the staircase, and made available for ventilation. A large tower carried up over the central staircase will contain a large tank for the supply of all the other cisterns, and to be used by hydrant in case of fire. In the smaller towers are the cisterns for the supply of hot and cold water for the several baths, lavatories, and W.Cs. The arrangements will be understood on reference to the plans.

The buildings are approached from the south, with suitable lodge and gates. The general entrance to the building for patients, &c., to the porter's room, the committee-room, the visitor's room, the superintendent's office, the clerks' and steward's offices, storerooms, and other offices, is on the north side; there being one general entrance to all, with a road diverging to the stores.

The accommodation for the male and female patients is kept distinct on either side of the central entrance and grand hall. This central grand entrance and staircase is only used for visitors on state occasions, leading up to the entertainment hall. The building on each side is divided, as before mentioned, into wards, with four attendants to each ward.

The building consists of three stories; the upper story being exclusively devoted to sleeping accommodation.

There is provided in the basement, central on both sides, a series of rooms for a Turkish bath, hot-air and vapour bath.

The kitchen is placed central to the whole establishment, surrounded by the several stores. Attached to the kitchen is a large serving-room, with lifts to each floor.

On referring to the plan, it will be seen how convenient the arrangement is for the distribution of food to each department. Sleeping accommodation is provided for the servants over part of the stores, with separate stairs, and altogether distinct from the rest of the establishment.

A large hall is provided central to both sides, having service-rooms and lifts from the kitchen, so as to serve for public dinners if required; also cloak-rooms for ladies and gentlemen. The hall is fitted with a platform at the end, and a gallery is provided, which may be made available for an orchestra.

Provision is made for the following officers:—

Medical superintendent—Two sitting-rooms, library, five bedrooms, bath-room, kitchen, and necessary offices, and so arranged that the servants are barred from all communication with any part of the general buildings.

The assistant medical officer, the steward, and housekeeper have each one living-room, one bedroom, and bath-room; the chief attendant on each side, a bedroom, and separate room to be used as store or office. The steward's rooms and office are close to his stores, on the north side. Wine, beer, and coal cellars in the basement. All coals are carried up to the several floors by lifts, and there is a shoot from each floor to the basement for ashes. Close to the kitchen on each side is a separate dining-room for the attendants.

Sleeping accommodation is provided for the domestic servants in the centre of the building, with a servants' hall and W.C. The day-rooms are so arranged as to have ready access to the airing-grounds; those for the aged and infirm are on the ground-floor. A billiard-room is provided on the third floor, close to the central tower.

On the ground floor on each side, near to the centre of the building, is a library for male, also separate one for female, patients.

The associated dormitories, for clean and healthy patients, have from 60 to 80 superficial feet for each. The separate sleeping-rooms for the first-class have 170 superficial feet; and second-class, 85 superficial feet. The water-closets in all parts of the establishment are to be arranged on the same system, each water-closet ventilated separately by a pipe passing to the outer air from below its trap, so that the sewer gas will pass away through it. This is extra to the special ventilation of the drains.

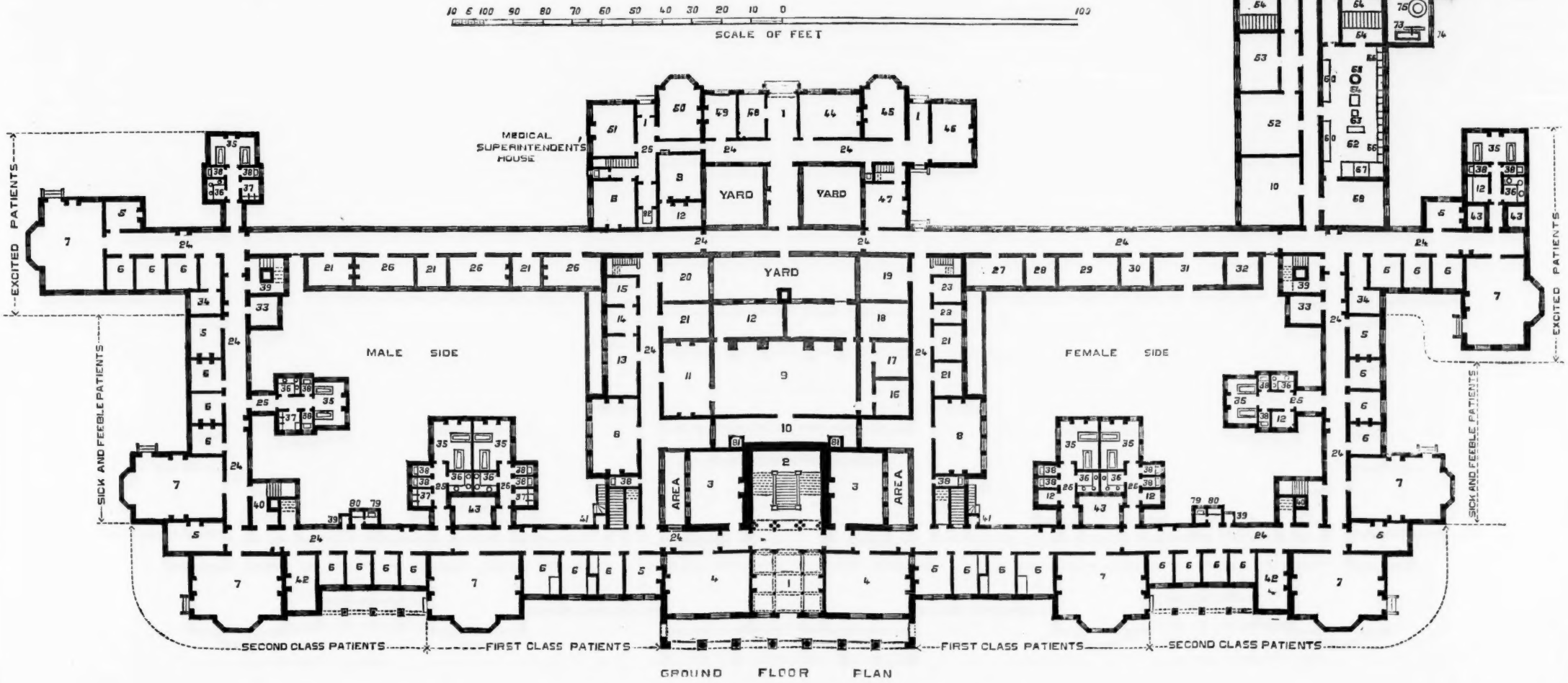
A special compartment is to be constructed in a large chimney to be used for extracting foul air from the drains.

The system of ventilation adopted is that used in other buildings of this class; foul-air flues from each of the single rooms and dormitories into a horizontal flue in the roof, leading into a ventilating shaft, and by means of rarefaction extracted. The fresh-air flues are from the basement, where the air is warmed. The ventilation of the dormitories is effected by gas-burners placed in the ceilings, and carried in flues in the walls. In the extracting or ventilating shaft in the towers, hot-water cisterns are placed, so as to rarify the air. All the flues are to be lined with glazed socket drain-pipes, and all the external walls are to be hollow, with 2 in. cavities.

* See pp. 607, 609, *ante*.

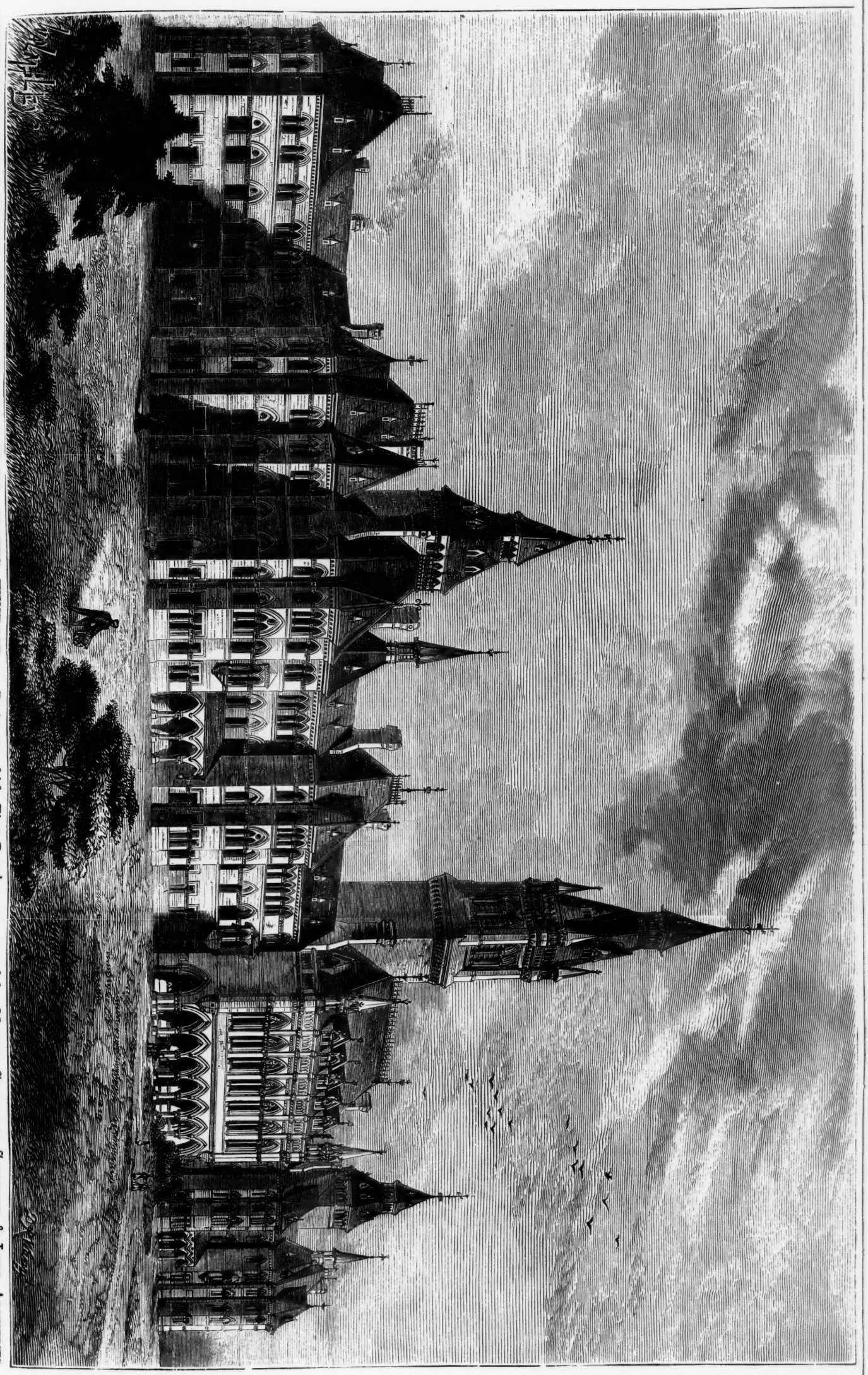
REFERENCES

1. Hall.
2. Principal stairs.
3. Library.
4. Dormitory.
5. Attendant.
6. Single room.
7. Day-room.
8. Attendants' dining-hall.
9. Kitchen.
10. Serving-room.
11. Servants' hall.
12. Scullery.
13. Bakery.
14. Flour. 15. Bread.
16. Bread-store.
17. Meat.
18. Cook's room.
19. Larder.
20. Vegetables.
21. Store.
22. Weighing-room.
23. Steward's office.
24. Corridor.
25. Passage.
26. Workshop.
27. Bedding.
28. Clothing.
29. Utensils.
30. Provisions. 31. Fuel.
32. Foul linen.
33. Padded room.
34. Half-padded room.
35. Bath-room.
36. Lavatory.
37. Urinals.
38. Water-closets.
39. Dust-shoot.
40. Main extracting-shaft.
41. Coal-lift.
42. Chief attendant.
43. Area.
44. Visitors.
45. Assist. medical officer.
46. Housekeeper's room.
47. Steward.
48. Porter.
49. Consulting-room.
50. Drawing-room.
51. Dining-room.
52. Folding-room.
53. Officers' washhouse.
54. Drying-closet.
55. Private laundry.
56. Coals.
57. Retort-house.
58. Purifying-house.
59. Ironing-stove.
60. Table. 61. Mangle.
62. Washhouse.
63. Boiler-washing machine.
64. Rinsing machine.
65. Centrifugal drying-machine.
66. Washing-troughs.
67. Steeping-tanks.
68. Dirty linen.
69. Foul-linen laundry.
70. Washing-machine.
71. Steeping-tanks.
72. Steam boilers.
73. Steam engine for pumping, &c.
74. Engine to pump water to large tower, and supply steam to laundry.
75. Well.
76. Supernumerary boiler in case of repair.
77. Chimney from boilers, gas-works, &c.
78. Gasometer.
79. Attendants' W.C.
80. Sink.
81. Lift. 82. Pantry.



GROUND FLOOR PLAN

PROPOSED LUNATIC ASYLUM, ST. ANN'S HEATH.



PROPOSED LUNATIC ASYLUM, ST. ANN'S HEATH, VIRGINIA WATER, WINDSOR.—*Design to which First Premium was awarded.* Messrs. Crossland, Salomons, & Jones, Architects.

DR. CARPENTER ON NATURAL LAWS.

The address of Dr. Carpenter as president of the British Association must have taken a great many of his colleagues by surprise, and has opened up a fertile field for discussion. "I hope," he says, "to satisfy you that those who set up their own conceptions of the orderly sequence which they discern in the phenomena of nature, as fixed and determinate laws, by which these phenomena not only are within all human experience, but always have been, and always must be, invariably governed, are really guilty of the intellectual arrogance they condemn in the systems of the ancients, and place themselves in diametrical antagonism to the real philosophers, by whose comprehensive grasp and penetrating insight that order has been so far disclosed." The absolute infallibility of scientific deduction, accepted without careful comparison and analysis, has never been taught either by ancient or modern philosophy. That is not an established fact in science which receives unsubstantiated phenomena as natural law; it is her vocation not to create, but to discover; and the fallibility of man is shown by the practical application, and not by the revelation, of natural laws. Let us take, as an illustration, the principles upon which an iron girder for a bridge is constructed. I presume it will not be contended that the parabolic transmission of the strain can depart under any circumstances from the law of gravitation, and if a weak portion of such a girder exists, it is in the manufacture of the iron and not in the *natural* fibre of the material; or it arises from a formula misapplied, or an error of calculation, and consequently a false distribution of power. It has, therefore, in its creation, a conceivable element of failure, which is a negative proof of the infallibility of natural laws, since the inferiority of the material or the insufficiency of sectional area is open to positive demonstration, either by test of the metal or investigation of the formula, which was founded upon a series of practical experiments upon the tensile or compressive qualities of iron, occurring in that "orderly sequence" against the belief in which we have been warned by Dr. Carpenter. From the practical success that is the result of these formulas, we may consider them to be "fixed and determinate laws."

The soundness of scientific inquiry is built upon precedent by the faculty of deduction, which can only arrive at a *faithful* result by a series of comparisons: a multitude, as it were, of converging lines to one common centre of observation.

This must establish the *truth* of any scientific inquiry before it can be tested by a practical result.

In speaking of the discoveries of Kepler, Dr. Carpenter says, "The first, that of the revolution of planets in elliptical orbits, *was based on the study of the observed places of Mars alone*; it might or might not be true of the other planets, for, so far as Kepler knew, there was no reason why the orbits of some of them might not be the concentric circles which he had first supposed that of Mars to be." The context given by Dr. Carpenter is the answer to his objection: there was *no reason* in the absence of sufficient evidence of "this application to other cases." Here was wanting that very circumstantial deduction without which no man of science would have been warranted in concluding that because a law was obviously governing the movements of *one*, it was equally controlling the rest of the planets. In my late articles on "The Harmony and Application of Natural Laws," for which you were good enough to find space in your columns, I may, perhaps, be pardoned some satisfaction (in agreeing in one respect where I have differed in many from so high an authority), that I dwelt especially upon the necessity of the labour and patience of research, as the only means by which we could be liberated from the entanglements of falsehood and error; and, knowing the *truth*, by that knowledge be made free.

And considering this question in its religious aspect, it cannot be said of the artist, of the poet, or the philosopher, that he is distinct from the others in his interpretation of nature; but in the religious application and ethics of natural laws, the two former are distinct from the philosopher, as they are often the expounders of things which are unseen, and the basis of their teaching is therefore that of faith. Science does not admit of anything like that which the artist knows to be sometimes essential, the accident of his picture, *the shadow of a cloud which is not upon his canvas*. She can raise no emotional feelings like the poet, from the source of ideality; she cannot draw from the beautiful well-spring of legendary lore. She must be true *only* to herself, or she will be false to the great principles she expounds. Her region is that of formula and fact; upon the former the latter must be built, and the deductions which are the result are the truths of science, and *are in unison with natural laws*. On one occasion I heard at a philosophical discussion this astounding statement from a clergyman of the Church of England, "that formula was only another name for going round about truth, and never arriving at it." Religion gains nothing by statements such as this, and she loses much,—she loses that tolerance which should exist between science and her own professors. It aggravates the antagonism already existing, and widens the breach which I believe it is within the province of science to surmount.

Science, by the application of natural laws, may not only achieve the purposes of the Creator, but it is fulfilling the very ordinance of religion by "the light which it causes to shine before men;" but we cannot start with religion, and strive to reconcile the immutable laws of nature with every one's preconceived doctrine of theology, but must rather be led, by the comprehension of natural laws, from—

"Nature up to Nature's God."

Byng Giraud.

LIGHTNING CONDUCTORS.

The electric peculiarities of this season have led to a discussion of the subject of lightning conductors in the *Times*. In a letter signed "E. B. Denison" the writer says,—

"When I was managing the fixing of the Westminster clock, I found that Sir W. Snow-Harris had actually embedded the conductors of the clock-tower,—flat copper bars,—in the walls, and he did much the same at Exeter Cathedral, and in the wooden masts of ships. In fact, glass collars are hardly less absurd than the glass finial which I remember an architect putting on a spire, with a view to keeping off the lightning, which resented the insult by knocking over the spire in four years.

I must, however, add a warning in the opposite direction, as many people will be putting up conductors after all these thunderstorms. The conductors of spires should be fixed to the very bottom of the vane-rod, if there is one, and not above it, otherwise the electricity runs down to the end of the rod, and, finding no continuous metallic communication, leaps across to the spire, and either smashes it or sets it on fire. . . . . The lead on a spire should be connected with the ground by a conductor, which may be a spout (called by builders a conductor in another sense). The copper ropes are safer from damage inside the tower than outside."

As a cheap and efficient conductor for houses, Mr. Alfred Varley recommends "gas barrel":—

"This can be bought at any ironmonger's in lengths varying from 1 ft. to 12 ft., each length being furnished with screws and sockets for connecting the barrel together. The gas-barrel has also the advantage of being stiff as well as cheap.

The first 12 ft. should be driven into the earth, and, where practicable, the barrel may be connected to the water-pipes.

The barrel should be led up the house, outside the walls in as straight a line as practicable, and attached to the house by iron staples driven into the walls, or by any other suitable way.

The top length, which should be carried to some height above the house,—say 15 ft. to 20 ft. (the higher the better),—may be terminated with a pointed copper rod attached to the interior of the top length of the barrel.

The retail price of gas-barrel is about 4½d. per foot for ½-inch barrel, and about 6d. per foot for ¾-inch barrel; to this must be added the cost of screwing the lengths together and attaching the pipe to the wall,—not an expensive operation."

In a compilation (for trade purposes) by Messrs. J. W. Gray & Son, whose system was patented under the cognizance of Sir W. Snow-Harris, and has been carried out in the Houses of Parliament, the Royal Navy, and many public buildings, the compilers remark that,—

"It is now well known that metallic substances have not in themselves any more attractive influence for the agency of lightning than any other kind of common matter; that, in short, all matter is equally indifferent to ordinary electricity in a free state, such as the electrical discharge. Lightning, in certain cases, only falls on metallic substances, rather than other substances, from the circumstance of these affording less resistance to its progress when occupying a certain position in space, aided, perhaps, by pointed terminations, which have a sort of mechanical action in further lessening the resistance in their immediate vicinity; but lightning will not so fall if a less resisting path be open to it in any other direction, even though it may happen to be through worse conducting matter. If the metallic substance be not present, still lightning will strike on the next best conductors; hence it is found that, in a great variety of instances, lightning appears to avoid pointed or other metallic substances, passing them by altogether."

"We have found from experience that it is requisite to link into one great chain all parts of the building: the metallic bodies, chimney-stacks, &c., employed in the construction of the building; and provide, in connexion with these one or more capacious conducting channels between the highest points and the ground, regard being had to the nature of the soil and the extent and disposition of the metallic bodies in the building, so that on any explosion of lightning falling on the general fabric, the electric matter could not move by disruptive discharge upon any circuit of which these main channels did not constitute a part."

The common methods of lightning-rods, they consider, are of too partial and precarious a character, and based upon principles too hypothetical, to be admissible as a complete (if any) security against the terrible agency of lightning. "It has been, for example, supposed that a common lightning-rod would influence the discharge of a cloud at a distance equal to two-thirds of the altitude of the rod, and would hence give protection to that extent, which is certainly not only an unproved assumption, but is contradicted by positive facts, especially in the observed operation of lightning on ships of the Royal Navy, from the official journals of which a vast and most important series of observations relative to atmospheric electricity have been derived."

Mr. Latimer Clark thus describes a simple and inexpensive lightning conductor:—

"Take four similar lengths of ordinary galvanised No. 8 wire, which is the wire commonly used for telegraphic purposes, and is about an eighth of an inch in diameter. The four wires are, by means of a stout stick, to be twisted together into a rope of sufficient length to reach from the top of the highest chimney to the ground, and to extend 20 ft. or 30 ft. under-ground. This rope may project a few inches above the chimney, and the wires may be spread out into forks and pointed. If several chimneys rise of the same height, the conductor should be slightly raised above them, so as to protect the whole. It may be fixed in any manner or direction, either within or without the house, as found most convenient, but if there be any leaden gutters or pipes near its path it is preferable that it should touch them. When the conductor reaches the ground a little more care is desirable. If it be buried for 10 ft. or 12 ft. in thoroughly wet ground, such as that afforded by a drain or well, it will be secure; or, if it be placed in full contact with any water-pipe or gas-pipe; but if damp earth be not obtainable, about 20 ft., or 30 ft. of its length should be buried, either in a straight or crooked direction, in the ordinary soil, at a depth of 2 ft. or more. The only remaining precaution is to take care that this conductor never becomes severed at the bottom either by decay or wilful injury. For large or lofty buildings, and in all cases where expense is not an important consideration, and where great security and permanency are desired, it is better to resort to skilled advice and to use copper conductors. Most modern houses of good construction are unintentionally provided with efficient conductors; the eaves and ridges are covered with lead, and these communicate by metal spouts with each other and with the ground, and commonly also by cisterns and water-pipes with the iron mains of the town."

THE NEW GLOBE BRIDGE AT PECKHAM AND THE TRADESMEN.

From the statements made by a deputation of tradesmen and shopkeepers who waited on the Camberwell vestry, at their meeting last week, it would appear that serious injury is being inflicted by the delay now taking place in the construction of the new Globe Bridge at present in course of erection for the Camberwell vestry over the Surrey Canal in Commercial-road, Peckham. The vestry seem to have been singularly unfortunate as regards the contract for this undertaking. In the first instance, the original contractor, whose tender was remarkably low as compared with those of his competitors, was unable to complete his sureties, the result of which was that the vestry had to advertise for fresh tenders, which was followed by the acceptance of the present contractor's tender. A few weeks ago, the latter intimated to the vestry that he could not go on with the contract unless certain relaxations in his favour were made, and he proposed throwing the contract up. A subsequent understanding, however, between the vestry and the contractor and his sureties appeared to be a guarantee of the works being vigorously proceeded with, but there are still loud complaints of the delay in construction, and its injurious consequences to the tradesmen in the neighbourhood. They allege that after having had to endure, for an unreasonably long time, a stack of bricks deposited in front of their shops the construction of the bridge commenced, but that it proceeds so slowly as to give no promise of a termination, and that in the meantime their businesses are being ruined, one of the deputation stating that recently, on a day which he named, he only took 6d. in his shop during the whole of the day.

The statements of the deputation elicited considerable discussion, in the course of which several members of the vestry expressed much sympathy with them.

One vestryman stated that having paid a visit to the works, and finding they were not progressing satisfactorily, he had urged the committee to close with the contractor at once;

whereupon Mr. Dresser Rogers, the chairman of the committee, stated that steps to that effect had already been taken, the sureties having been called upon to perform the work.

Another member of the vestry suggested that the penalties should be rigidly imposed if the contractor did not complete the work within the stipulated time, and that the tradesmen who were suffering should be reimbursed out of those penalties.

It was ultimately decided to inform the contractor and sureties that the penalties will be enforced if the work is not completed within the specified period. The terms of the contract are that the contractor is to finish the work in six months from the 1st of April last, the penalties for non-fulfilment of the contract being 20*l.* per week.

It is altogether improbable that the terms of the contract will be complied with. Nearly five months of the time have already expired, and the coffer-dams are still in the canal without any piers in sight.

OLD CHURCHES AND NEW.

If it were wished to adduce in a practical and familiar way any one subject which should carry conviction to the general public mind of the wide gulf of difference between the old system of putting a building together, and afterwards of "decorating" it, and the modern of to-day mode of doing such work, it would be to instance a good old-fashioned *unrestored* church of almost any date,—*i.e.*, Middle-Age date. It may be useful at the present time to note some of these differences between the old and modern work, and to try to find out how to build a modern church that shall look like an old one, or, rather, so to build it as to follow the ancient method of design and work,—in short, to build artistically, like the men of past times. And, first, it is to be noted, if you visit an unrestored church, no matter of what date, it is truly surprising how little you find in it to specially talk about: the place seems almost empty: there is nothing in it or about it that one would naturally expect to find in a place which you are told is almost a museum of fine art. But go into a quite new modern church, of the ordinary type, built with but moderate funds; and there is almost no end of details. The floor is half-covered with smart and new encaustic tiles, sometimes not a little glaringly clean; the walls usually plastered, and thickly coated with drab-coloured wash, even if they be not painted with the usual coatings of common oil-colour. There is almost no end of *windows*, more or less elaborately filled in with tracery: so many on one side and so many on the other,—indeed, every bay between the buttresses has its window,—that is, where the doorways or porches do not come in. There is, of course, a large east window, and a large west window. If the church has aisles, there is the clearstory also, with its regularly-arranged series of lights. We know all this by heart: a new church of the usual Gothic type is as much a cut-and-dried affair as a ready-made coat, of which some thousands are cut out by a machine made expressly to do it. The roof-timbers may differ a little in actual disposal, but there they are, and the *dimensions* of them may be seen in any of the useful guide-books to church-building. And then there are the two porches, of course, and the tower and spire. What a curious thing is a modern church!

But as a contrast to all this regularity, and primness, and neatness, and ornament, it is not a little striking to examine a thoroughly neglected, unrestored, and almost disreputable old church, of almost any date and style of Gothic. The first thought about it is, how very plain and meagre it all looks and is. We well recollect seeing a church of this type in a somewhat out-of-the-way place, at some small distance from a town. The "side elevation" of this unpretending structure, fourteenth-century work, had but *one* solitary buttress in it, viz., the strut and merely constitutional one, put there not because a buttress is a Gothic feature of architecture, but for the sole purpose of resisting the thrust of the heavy chancel arch. It was long and it was broad, and without ornament of any kind, but it did its work well, and looked thoroughly *useful*. There were no side windows in the chancel, nothing but the plain rough stone walling. There were two very plain and simple-looking windows in the one side elevation of the church, and none in the other. No clearstory. The west window seemed to do all the lighting of the church. A sombre place inside, shabby some might call it, dingy certainly; but in reality full of colour and light and shade of the true sort, something for a picture of an old deserted church, and full of memories of the past. It would take too long to go into detail and to name every individual thing in the place, from the altar-table to the solitary four-light chandelier hanging from the dingy roof, but one or two things must be named to make our meaning and intention clear.

First, then, the floor: nothing but very rough and worn paving visible, except in the chancel, where there were some dozen or so of encaustic tiles, all of different patterns, much worn, and of no small interest, each tile quite a little study, full of drawing and colour in the true sense of that word. In the chancel window were a few fragments of painted glass, but, few as they were, they had the effect of filling the eye with the pleasing sense of colour and even form, for the fragments were of great interest, and were enough in number to show what the window was when complete. Quite a picture in coloured glass. Amid the dimness of the dull chancel this window, or rather fragment of it, quite satisfied the mind, and with the tiles filled the eye with the sense of colour, as we have said. Of the main body of the church itself it is almost needless to speak, for there was literally nothing in it to talk about in the art sense as now understood. There was not a single fragment of ornament anywhere to be found in it, not that it had been destroyed, but it never had any existence. The capitals of the nave columns supporting the nave wall and roof were composed of a few mouldings, hardly noticeable. The columns were round. We must not, however, forget the chancel arch, for although it had but one or two mouldings and no carving of any kind, its effect was singularly impressive from its mass, and depth, and look of solidity. We must repeat that the whole interior of this church did not contain, beyond the tiles and the glass fragments, one single bit of ornament; the whole effect was got out of solid architectural forms, useful construction, and real material. We do not propose to say anything on the fate of this particular church, for it passed through the same phase which all old churches have already passed through or are destined to pass through. There is as much ornament added to the ancient structure as would have served for the ornamenting of a dozen or two of such buildings in bygone times. Two things more unlike each other than a modern restoration church and one of them in a primitive state there cannot possibly be. It is the difference between art and art-manufacture. There is a gulf of difference between the two ideas.

But our main object in thus calling a passing attention to the almost extinct old church in its *bonâ fide* state is for the purpose of showing how independent to a great extent is architecture of sculpture and painting. These may come afterwards and decorate it, and make it more interesting and impressive, but architecture, *per se*, is a something. Here we have a building of excessive plainness, nay almost poverty, with ornament, as that word is now understood, absent; but still most impressive. Architecture *per se*, as we have said; but, it must be recollected, architecture with *individuality* stamped legibly on it. It was impossible to look on the *walls* even, *i.e.*, the bare walls, without interest; surely the men of past times, ignorant as they doubtless were of all that makes up modern science, were artistically more capable than we moderns. The mere wall builder must have been a thinking man, as well as a workman; for, if not, how is it that all old masonry, mere walling, is a something to look at. No ornament is necessary, the mere and simple wall is enough, and seems to invite the eye to look at it; you cannot help thinking that there must be something more in it than there really is, or well can be. Surely modern men have yet to do the walling of a church, as it ought to be done and has been done! There is another reason for our calling a moment's attention to these strange facts, interesting to a few minds certainly, and that is that having got architecture *per se*, *i.e.*, the useful building, and without as yet any ornament, even a fragment of it; it then becomes a task to add to the interest of such structure by the addition to it of sculpture and painting, or decoration, to use a word of somewhat wider meaning.

The problem arises, how to do this in the best and truest way, and sometimes in the cheapest? Our answer would be, to call in the aid of the artist, or the artist-workman, to do a little, or a little at a time. Exclude altogether the system of art manufacture. Let us employ, if it be possible, the artist himself to do a little, a very little it may be, of decorative work. Suppose, for instance, the building be perfectly plain, like the church we have cited; let the artist come in and paint but one small panel as *bonâ fide* work: that is, real work, his own work. Will not this be of infinitely greater interest, little as it may be, than to have the whole building covered up and hidden away by the shop decorative system? Suppose it is *sculpture* that is wanted: a few heads or a few fragments of ornament, suppose it be only a row of ornament round the chancel arch done by artistic uands, the thought and the execution by the same man,—would not this be more impressive than the miles of "enrichment" we see everywhere, and but for which modern buildings would be entirely bare of "architecture," and would be called "building"? No subject can well be more suggestive than this at the present time, for it is impossible to deny that more money is expended on art nowadays than ever before. The picture which a few years back brought to its industrious painter some hundred pounds, now finds purchasers at the rate of three or four thousand. The cup and saucer painted by a clever artist-workman for a few shillings is now competed for, at our wonderful auction sales, with heavy bank-notes! What are our artist-workmen doing that they cannot bring their work, if not into the church or the palace, at least into the auction-room?

We must start *de novo*, and to build a new church, or new law courts, or to decorate a cathedral, or to really *restore* or add worthily to an old church, we must surely begin all over again,—not by expecting that such work can be accomplished by the hiring whole gangs of workmen to do the art-work "*under superintendence*," and by one man following another, as in the art manufacture of plates and dishes, but by the strict adherence to the one great principle on which all the old work was really done, viz., by the employment of the human agency,—as human, *i.e.*, *mind and hand*, and not as in a machine, wherein each man, or agency, is as a wheel in such machine, and sometimes as a cog merely in each individual wheel. This is to work the very soul out of a man, and to reduce him to the level of mere insensate matter, or little better; and it, of course, shows itself in the work he does. The real principle of work is the same in truth for workman as well as for artist, and it is that he shall work as an individual. The architect, the painter, the sculptor, the workman, are in reality as one, and their work is one; but it must be *bodily* as well as *mentally*, and mentally as well as bodily, and it is only in this way that nature has bestowed on man the power to create; but to do this he must not only create mentally, but he must realise manually. It is not either separately, but both together, that have produced the magnificent realities of the "old time before us."

"AN ECONOMICAL STOVE."

In answer to the appeal for an economical stove, allow me to draw your attention to a stove that has existed and been used with perfect success in Italy for some time. It involves the necessity of its being heated with charcoal instead of coal, which, in these times of dearness of coal, might prove a veritable boon.

I send you the description as advertised in the Italian papers, and will order the proprietor to communicate with the Council of the Society of Arts on the subject.

The use of this stove is extensively spread through France as well as Italy, and, when adopted by those studying economy, has proved of eminent service.

The apparatus is of iron; part is tinned, part galvanised; it weighs not more than 15 kilogrammes, or 33¾ lb., and occupies about the space of a cube of half a mètre. It requires no particular spot on which to be placed;—can be either on the ground, in a chimney-place, on a table or chair, in the corner of a shop or room.

In addition to its moderate cost, it does away with all the expense of kitchen utensils, the necessary recipients for the cooking of the different dishes forming part of the apparatus itself.

The fire is made of charcoal, broken in small pieces, the size of a nut.

To cook a dinner for six or eight persons (in France and Italy), a half-penny worth of charcoal is sufficient. The receiver of the charcoal is placed in the midst of the water: this precludes all danger. The water while boiling heats either by *bain-marie* or by steam the receivers, in which are placed the soup, meat, or vegetables. The receiver in which is placed the *roast* alone is in direct communication with the fire. Potatoes, or any other vegetable, by means of an especial receiver, can be cooked without water, and by steam only, thus preserving the taste in perfection. By means of an iron lid (like the country oven) sweets and pastry are successfully cooked, a lighted piece of charcoal being placed on the top of the lid; in fact, the charcoal once placed in the receiver, the apparatus works itself without demanding any watching.

Left to itself, the fire will last five or six hours, at the end of which the dinner is cooked, ready to be served.

There then remains in the apparatus the water of the *bain-marie*, limpid and clear, to wash the plates, or for any other purpose.

It is very simple, without any complication, any mechanism, lasts very long, is easy to arrange, offering no difficulties in the using to whoever will, for the first two or three times only, pay attention to the minute and clear instructions which are sent with the stove.

The price of these stoves, ready packed for exportation, is 1*l.* 18s. 6d., at the present rate of exchange. Why cannot charcoal be more extensively utilised in the present coal panic? This economic stove is manufactured at and exported only from Turin. F. C.

Florence.

OPENING OF THE CROSLAND MOOR WORKHOUSE, HUDDERSFIELD.

The completion of the workhouse at Crosland Moor has been celebrated by a luncheon, to which the guardians and other gentlemen were invited. There are a few finishing strokes to give to the building, and all the rooms are not yet furnished.

The buildings have been erected at a cost of 24,000*l.*, on an eminence which commands a fine view of beautiful scenery, and the situation is healthy and salubrious. The principal entrance is on the north side, abutting the highway. The road is 20 ft. wide, and on either side, to the extent of 150 yards, as far as the lodge gates, trees are to be planted, and thus the institution will be approached by an avenue. The façade of the building faces due east, and the premises are so situated and designed as to admit of the entrance, in every quarter, of the sun's beams.

The building is erected of stone, procured from quarries in the locality, in the Domestic Gothic style of architecture, from designs prepared by Messrs. John Kirk & Sons, of Huddersfield and Dewsbury.

The centre building is 216 ft. long and 52 ft. broad, and three stories high, arranged as follows, viz.:—In the centre is the principal entrance and staircase, and branching right and left is a corridor, 8 ft. wide on each floor, which will be used for easy access to all the rooms, and for ventilation. In the centre tower is placed a large tank, containing 10,000 gallons of water, to supply all the closets, lavatories, baths, &c. Provision is also made to attach a plug and hose on each landing in case of fire.

On the right of the principal entrance, on the ground floor, is the governor's office; on the left, the matron's room. Over the same is the visiting committee's room, the governor's private rooms, and bedrooms. On each side of the staircase is a room set apart for clothing-stores; also one room on each floor above for sundry stores. The remaining part of this building, on the right hand, is divided into six day-rooms for the men; with four staircases to the dormitories, and doors into airing-grounds; and, to the left, into six day-rooms for the women, also with four staircases to the dormitories, and doors into the airing-grounds; making accommodation for 218 inmates. Behind this building, in the centre, with a direct road from the corridor under the principal staircase, is the dining-hall, 58 ft. long by 35 ft. wide, with an open timber roof, and fitted up with desks and seats, and a reading-desk, and will seat 320. To the left of the dining-hall is the paid servants' sitting-room, kitchen, scullery, and a large cooking kitchen, fitted up with a steam apparatus; also the bread-stores and general stores. The larders are under the bread-stores and general stores, and arched over.

The bakehouse, coals, and out-offices for the servants, with a closed yard, are all conveniently arranged: to the right of this is the refractory ward, and a large coal-store covered over with a slated roof; and to the left is the wash-house, drying-room, and laundry. The boiler-house is so placed as to be convenient both for cooking-kitchen and wash-house.

To the right of the main building is the hospital, a two-storied building, 131 ft. long, one half for males, and one half for females, each with separate entrances, staircases, and airing-grounds, and is divided into ten sick-rooms, two convalescent day-rooms, surgery, kitchen, scullery, and nurses' rooms, bath-rooms, and store-rooms. All the sick rooms are so arranged as to be well ventilated, having windows on three sides, all well supplied with water-closets, lavatories, with hot and cold water; and will accommodate 32 males and 43 females. The airing-grounds are large and open, being to the front, and will have a low wall and palisading. A little beyond this is the building for fever and infectious diseases, with similar arrangements to the large hospital, and will accommodate 10 males and 10 females.

To the left of the main building is the school, 140 ft. long, consisting of two day-rooms, two school-rooms, two class-rooms, and sitting-rooms for the teachers. The schools and class-rooms are fitted up with galleries. At the back are covered sheds, for the children to play under in bad weather. The dormitories are on the first floor. There are large playgrounds, with wall and palisading.

The total number provided for is as follows:—Main building, 218; hospital, 75; infectious ward, 20; children, 100,—total, 413.

At the entrance is the porter's lodge, a two-storied building, with a weighing-machine. Attached behind the lodge are the receiving-wards for each sex, with day and night rooms, fitted up with bath-rooms. Near to the porter's lodge is the vagrant ward, the entrance being from Nab Croft-lane, and is so arranged in separate yards and day and night rooms that thirty males and fifteen females can have a night's lodging at the same time, each ward having bath-rooms, &c. Work-rooms are also provided.

The architects have confined the expenditure within the estimates. The contractors were:—Masons, Messrs. A. Graham & Sons; joiners, Messrs. W. Fawcett & Sons; plasterers, Messrs. T. Longbottom & Sons; plumber, Mr. H. Garton; painter, Mr. G. Brighouse; slaters, Messrs. W. Goodwin & Sons; and ironfounders, Messrs. T. A. Heaps & Co.

Mr. Kirk, in responding, at the luncheon, to the toast of "The Architects," said the entire measurement of the workhouse was 8,243 yards. The cost of erection was 2*l.* 15s. per yard, but it would be 3*l.* if they took in the boundary-walls and palisading. They could not build a cottage house for a less price than 2*l.* 10s. per yard, so that they had given the guardians a very cheap building. If they took the number of inmates at 450, 55*l.* per head would cover the whole cost.

BRISTOL CORN EXCHANGE.

This building was originally executed from the designs of Mr. Wood in 1745, and contained an inner quadrangle, surrounded by colonnades of the Corinthian order. In this quadrangle, one story in height, and open to the weather, the important business of the exchange has until now been carried on. Many complaints of the inconveniences of such an arrangement have, however, been made, and the corporation of Bristol at length determined that the quadrangle should be covered, and protected from the weather, by a roof of iron and glass. They accordingly consulted Mr. Edward M. Barry, R.A., and the work has been carried out from his designs, and has just been opened to the public. The quadrangle is 50 ft. square, within the columns of the colonnades, which latter are about 15 ft. wide and 16 ft. high. Over the colonnades, and below the springing of the roof, there has been constructed a story of offices, 10 ft. high, with semicircular arched windows, looking into the quadrangle, each office having also a direct opening to the external air for ventilation. Between the arched windows, and over each column, are carved figures, or caryatides, well executed by Mr. E. W. Wynn, sculptor. From these figures start the arched principals of the roof, which is of wrought-iron and glass, and rises to a height of 66 ft., in the centre, from the floor. A balcony or gallery runs all round the building at the springing of the roof, to give access to the lower part of it, which is vertical, and made to open for ventilation. The central lantern at the apex of the roof is open for a similar reason. The main ribs and the purlins are arched in form, and are filled in with open ornamental tracery, arranged constructionally. The lower part of the roof forms a vertical story of iron and glass. Three arched openings occupy the space between each principal, and can be opened or closed as may be desired. The roof itself is pyramidal, and slightly curved in section. The work has been carried out in Bath stone by Mr. G. W. Booth, of Gosport, and the sub-contractor for the iron roof was Mr. Cormell, of Cheltenham. Mr. W. Long was the clerk of the works. The cost has been between 6,000*l.* and 7,000*l.*

The Corn Exchange Committee, in a report just made to the corporation, dwelt with satisfaction on the work, and state their opinion that the public of Bristol will share their sentiments. The completion of the building was celebrated by a public dinner of those interested in the corn trade, at Bristol, on the 15th inst., under the presidency of the mayor, Mr. W. Proctor Baker.

THE STREET IMPROVEMENTS AT ST. MARY-LE-STRAND.

The improvement now going forward in the Strand, between Newcastle-street and Somerset House, consequent upon the absorption into the thoroughfare of a portion of St. Mary's Churchyard and boundary walls, which has already been briefly noticed in the *Builder*, is no doubt one that will be attended by a great public benefit, and an advantage to both pedestrians and carriage traffic. Within the last few days a numerous body of spectators have been attracted to the novel process of laying down the wooden pavement which has been completed during the present week. We have, however, heard one fault found with this otherwise valuable improvement, and the feeling in this particular seems to be general. It is well known that hitherto there has been no footpath whatever on that portion of the north side of the Strand, along St. Mary's Church, a defect in pedestrian locomotive agency which has not only been a source of inconvenience, but of danger. The demolition of the churchyard boundary-wall admitted of an opportunity for the construction of a footpath of reasonable width; this opportunity has not, however, been availed of in the work now in progress, but the improvement is being confined to the making of a passage for pedestrians under the church wall, of little more than 2 ft. in width, which will scarcely admit of two persons meeting and passing each other, thus rendering the new and contracted footpath almost valueless. It is suggested that the footpath might have been rendered far more useful by taking an additional foot or 18 in. from the carriage-way, without any appreciable difference being made in the latter, or causing the least inconvenience to vehicular traffic.

THE SOUTH LONDON WATER SUPPLY.

A supply of purer water than has ever yet been received from the Lambeth Company will now be poured into their cisterns. The company have spent in obtaining it about 50,000*l.*, and they propose to expend 70,000*l.* more in completing the scheme. Anticipating Mr. Stansfeld's Act for the improvement of the metropolitan water-supply, the Lambeth Company resolved to move their intake higher up the river than the restricted ten miles from London. They selected a spot at Hampton Court, which had been pronounced by the Royal Commission of 1867 to furnish the purest Thames water. An intake was formed there, and three-and-a-half miles of conduit laid down to connect it with the existing reservoirs at Thames Ditton. The directors and officials of the company have just visited Hampton Court to witness the turning on of the new supply. The Lambeth district at present comprises an area of about fifty square miles, and contains 300 miles of piping. The consumption within that area averages 11 millions of gallons per day, its maximum being about 13 millions. The new intake will supply about double that quantity, Mr. Taylor, the engineer, estimating the maximum delivery of the conduit when full at 26 million gallons per day, and the average throughout the year at 20 millions. Between the new intake and the reservoirs at

Hampton Court there is a fall of about 6 ft., which gives the current a velocity of about two miles an hour. Ultimately the supply will be largely increased by forming reservoirs near the new intake, and converting those at Thames Ditton into filtering-beds.

THE LONDON BUILDING TRADES MOVEMENT.

The central committee of the carpenters and joiners having determined to appoint a deputation with full power to arrange with the masters' committee, a communication to that effect was sent to the latter, requesting them to appoint a time for receiving the deputation of the men to treat for a settlement of the dispute. The secretary of the central committee has received a letter from the assistant secretary of the Masters' Association, stating that a special meeting of the general committee of the association would be held on Thursday (this day), after which the resolution of the delegates of the carpenters would be laid before it for consideration, and it was understood that at the general committee meeting of the masters a sub-committee would be appointed to meet the men's deputation and arrange the terms of settlement, and that it was possible that this meeting might take place on Friday, but that the probabilities were that it would not be held until Monday, as there were several preliminaries to arrange before the meeting could be called.

PORTLAND CEMENT STAIRS.

Sir,—Referring to the letters appearing in the *Builder*, I can fully endorse the experience of your correspondent respecting the suitability of Portland cement concrete for stairs.

I herewith have pleasure in handing you a photograph of a circular concrete staircase and landing at the Patent Concrete Building Works, Lawson-street, Great Dover-street, London. The materials used in the construction are four parts burnt clay, one part clean sharp sand, and one part Portland cement. Three weeks after the erection of this staircase and landing, it was tested by loading it with men, as shown in photograph. The traffic up and down the staircase for the last two years has been very considerable, yet no trace of wear is perceptible.

For further good examples of this class of stairs, two flights already finished, and one in progress, may be seen at the block of industrial dwellings now erecting for the Peabody trustees at East-lane, Bermondsey.

I may mention that the nosings are not run on, after the steps are finished, but moulded entire, with the treads and risers, giving the appearance of hand-worked Portland stone.

Joseph Tall.

EXCLUSION OF INSECTS.

A correspondent writes from Florence:—Are you much plagued with flies? The best remedy I have seen is in the villa in which I am now staying. Every window is provided with sheets of wire gauze fixed in movable slight small window-frames. The gauze excludes neither the light nor air, is almost invisible, and the whole villa is free from flies, mosquitoes, or any similar nuisances.

There are many country houses in England where such an arrangement would conduce to comfort, especially in the wasp season.

"TREATMENT OF BUILDERS."

In our issue of the 10th inst. we requested an explanation from the writer of the letter on this subject, inserted on the 3rd, and contradicted on the 10th. The explanation is as under:—

"TREATMENT OF BUILDERS.

I, the undersigned Charles Brown, of South Cave, in the county of York, having written a letter, and having procured the same to be inserted in the *Builder* of the 3rd instant, signed 'A Lover of Straight Dealing,' and having made statements therein reflecting upon the conduct of a firm of Hull architects, but which statements I have since discovered to be wholly unfounded, hereby, in consideration of their staying legal proceedings against me, express my sincere contrition and regret that such statements as appeared in the said letter should have been made.

Dated this twenty-first day of August, 1872.

Charles Brown.

Witness, J. P. Chatham, Solicitor, Hull."

PITCH AS A PROTECTION AGAINST DAMP.

Sir,—I beg leave to offer the following suggestion regarding "T. H. W.'s" difficulty (*Builder*, p. 229):—On occasion of the unsatisfactory use of pitch inside the house, the outside was covered with Portland cement. May it not have been through the very impervious nature of the cement, that even the effluvium of the pitch was confined, while in the other instances it was absorbed by the damp of the walls, and then gradually perspired exteriorly?

Nihil.

ROMFORD SURVEYORSHIP.

"To Surveyors.—The Romford Local Board of Health will, at their meeting to be held on Monday, the 2nd day of September next, *consider* the applications of candidates desirous to be appointed Surveyor and Inspector of Nuisances for their district. *Should* a candidate be elected, he will be required to devote the whole of his time to the discharge of his duties, and must be prepared to enter into a bond, with two sufficient sureties, in a sum not exceeding 200*l*. Salary, 100*l*. per annum and house, the Board reserving the Board-room and Clerk's office. The Surveyor will have to *provide gas* and fuel for the use of the Board, and also for the use of the Romford Burial Board and the Romford School Board, *and must attend to the Board-room and Clerk's office*, for all which the yearly sum of 8*l*. will be allowed. Candidates are requested to send application to me, at my office, at Romford, on or before the 24th instant, stating age and qualifications, accompanied by testimonials.—By order of the Board,

A. H. Hunt, Clerk.

Romford, 8th August, 1872."

Sir,—Seeing the above advertisement in the *Builder* of last week, a thought struck me that I should suit the situation admirably: I have therefore sent in an application, of which the following is a copy, and knowing the interest you take in these matters, I should like to hear what you think of my *chance*. John Thomas.

[copy.]

A1, Lowther Arcade, Strand, W.C.,
20th August, 1872.

The Chairman and Members of the Local Board of Health, Romford.

Gentlemen,—I have the honour to make application for the appointment of Surveyor and Inspector of Nuisances to your Board.

I am thoroughly acquainted with the duties of such an office, having been an office messenger to a London surveyor for a long period. I am quite prepared to give my whole time to the business of the office, and part of my bedtime in addition.

I am rather taken aback, I must confess, at having to supply gas to the three Boards enumerated. The fuel I could manage; but as to attending to the Board-room and clerk's office, I can do that first-rate; and should the gentlemen of the Board have an occasional quiet dinner or take tea in the building after some of their arduous duties, why I can wait at table very nicely.

I may add that I am married, without encumbrance; height, 5 ft. 11 in.; aged 35; of good appearance; wife a good washer and getter-up of fine linen.—I am, &c.,

John Thomas.

P.S.—Testimonials are not sent, as I have always found them looked upon with suspicion in gentlemen's families, personal character being always preferred. When I say that I am distantly related to the beadle of the above arcade,—who is my wife's aunt's thirty-first cousin,—you will have no doubt about my giving you any number of personal references to noblemen and gentlemen.

EXPLOSION AND PREVENTION OF EXPLOSION BY MUSICAL TONES.

Observation that the gaslights in a drawing-room seemed to keep time with the music, showed that the vibrations excited by sound influenced the flame, which rises or sinks in proportion to the strokes it receives from the air. MM. Champion and Pellet have endeavoured to prove that heat alone would not be sufficient to cause an explosion, if it did not cause vibration. Starting from this proposition, they arrived at the conclusion that there must be some musical note able of itself to produce an explosion of certain explosive substances, without the assistance of heat. This deduction they have confirmed by fact. Iodide of nitrogen is a detonating substance, which may be handled freely so long as it is moist. The experimentalists put small portions of it in this state into little bags made of goldbeater's skin, which they hung to the strings of a bass-viol. When all was dry, the bow was applied to each chord in succession; and it was found that, while the low notes produced no effect whatever, the highest caused an explosion at the very outset. It was ascertained that at least sixty vibrations per second were necessary to lead to this result. Two parabolic mirrors being placed opposite to each other, at a distance of 8 ft., a drop of nitro-glycerine was put into one of the foci, and a bag of iodide in the other. The former being made to explode, the vibrations thus caused were reflected from one mirror to the other, and led to the explosion of the iodide.

These curious facts may now help to explain the almost simultaneous explosions of separated deposits or barrels of gunpowder in a magazine, when once a beginning of explosions takes place.

An interesting and useful application of the "musical flames" has been made by Dr. A. K. Irvine, and communicated to the Iron and Steel Institute, at Glasgow. This application takes the form of a miner's safety-lamp, indicating by sound the presence of explosive mixtures of gas and air, based on a new form of the singing flames. When a mixture of inflammable gas and air passes into the lamp, it is ignited on the surface of a disc of wire gauze, above which is placed a suitable chimney, in which is produced the musical sound, varying in pitch with the size of the flame and the dimensions of the chimney.

"PLACE AUX DAMES."

Sir,—I am aware that you have a leaning towards the support of authority, and that you have not joined in the crusade against Her Majesty's Chief Commissioner of Works so vigorously as some of us would like. You can scarcely, however, refuse to insert the following quotation from a leading article in the *Manchester Courier* of the 8th inst. After speaking of the dispute between Mr. Ayrton and Mr. E. M. Barry, as to the Houses of Parliament, the article proceeds,—

"But Mr. Ayrton had not done with Mr. Barry. He had to show him that a Chief Commissioner was not to be insulted with impunity, and that, above all things, he was never to be put in the wrong. As, however, Mr. Barry's relations with Mr. Ayrton were almost wholly at an end, it was difficult to see how the lesson was to be taught. But difficulty exists only for those who do not know how to take advantage of their opportunities, and this Mr. Ayrton most certainly does. The time soon came for revenge. Mr. Barry is carrying out certain rather extensive improvements at the National Gallery, but, contrary to ordinary custom, there has been no ceremony over the laying of the foundation-stone. The contractor for the work thought, however, that for his own gratification it would be pleasant to have a little entertainment on the occasion, and he therefore invited,—as is not uncommon under such circumstances,—the wife of the architect to officiate on the occasion. It will hardly be believed that a Minister of State could condescend to such a piece of petty and vulgar spite, but Mr. Ayrton actually interfered officially to prevent Mrs. Barry from taking the part in the proceedings to which she had been invited. After this, of course, all architects, market-gardeners, and similarly common people will understand their proper place, and will refrain, when fate brings them into contact with an Ayrton, from doing or saying anything by which he could possibly be offended, lest in the abundance of his virtue he should make them suffer in the persons of their wives."

Looker-on.

SCHOOL BOARDS.

Scarborough.—Tenders for executing the works required in erecting the proposed infant school at Falsgrave having been opened and examined, a sub-committee was appointed to examine and accept the tender most advantageous to the Board. The committee of the whole Board reported that they had inspected the designs, nineteen in number, submitted by competing architects for the proposed Central Board School, and expressed their opinion that the plans sent in by the following architects were the best:—(1) Mr. Thomas Oliver, Newcastle-upon-Tyne, estimate, 5,500*l*.; (2) Messrs. Stewart & Bury, Scarborough, estimate, 3,850*l*.; (3) Mr. Wm. Watson, Wakefield and Doncaster, estimate, 4,650*l*. The design submitted by Messrs. Stewart & Bury was ultimately accepted, subject to the same being approved by the Education Department, and also subject to the condition that a tender from a respectable contractor for the execution of the works within 10 per cent. of the amount of the estimate accompanying the plan be obtained.

Loans.—By an Act of Parliament just printed the Public Works Loan Commissioners are authorised to make advances to School Boards, in pursuance of the Elementary Education Act, 1870. Power is given to issue 1,000,000*l*. out of the Consolidated Fund for the purpose mentioned.

SAWING WOOD WITHOUT A SAW.

Electricity is, by the present invention, made to supersede a mechanical implement; threatens also to drive it into banishment; while the muscular and other forces which were so largely expended in their use are replaced by the action of the galvanic battery in one of its most simple forms.

The invention, which is described by the *Scientific Review*, was patented in the United States on the 28th of last May, by George Robinson, M.D., of New York.

That gentleman was aware that a galvanic current, in sufficient quantity, when passed over fine platinum wire, would raise its temperature to a red or even white heat. The most important application of the principle had previously lain in the employment of the heated wire in certain surgical operations as a substitute for the knife or red-hot iron. It was found that the red-hot wire easily cut or rather burnt its way through the living flesh, and tumours of considerable size were thus removed from the human body. The inventor's attention being fixed on the fact that sodden wet flesh was cut through in this way, a little reflection satisfied him that the division of wood, a comparatively dry substance even when green, could be more readily effected by the electrically heated wire. This proved to be the case; and on gently pressing pieces of wood against the red-hot platinum wire, especially when aided by a slight sawing movement, the wood was divided in any required direction as by a handsaw, and, of course, without any effort of skill or appreciable expenditure of muscular power. By arranging the wire with handles or other means, so as to guide it readily, the lumber, where in trees, logs, or planks, may be cut easily as desired. There is here, therefore, a simple and easily applied force, which in a child's hands may be employed to fell trees, divide them into logs, and, in short, perform all the operations of the saw and the axe. The surface of the wood where thus divided is, of course, slightly charred, but the black layer is very thin, and for many purposes not disadvantageous, as it is known to preserve timber. The battery employed need only be of the simplest character, as quantity and not intensity of currents, is required.

CHURCH-BUILDING NEWS.

Boughton (*Norfolk*).—The restoration of the parish church here is progressing, and will be reopened in September. The chancel and porch are rebuilt, and the nave and tower repaired and reroofed. The entire area is being refitted. Mr. Withers is the architect; and Messrs. Bardell, of Middleton, are the builders. The outlay will exceed 800*l.*

Ysputty Ystwith (*Cardiganshire*).—The church here is about to be pulled down and on another site it is intended to erect a new church, from the designs of Mr. Withers, of London. The nave and chancel will be under one roof, with an attached tower, 16 ft. square, forming north-west porch. The work will be done by Messrs. Jones, of Llwyngog, for 865*l.*, stone and carriage given.

Birlingham.—The parish church of Birlingham has been rebuilt and consecrated. The retired village of Birlingham is in one of the most fertile spots in the rich vale of Evesham. The church has been rebuilt from designs by Mr. B. Ferrey, of London. The tower is the only portion of the old building that remains. It has been repaired, and the bells have been re-hung by Mr. H. Wheeler, of Gloucester. The north-west angle, which contains the turret-stair, has been heightened, and crowned by a crocketed pyramidal stone covering. In this tower (the date of which is about 1450), the walls of the upper portion, immediately below the bells, are constructed internally to serve as a columbarium, or dovecote, having two small windows with projecting ledges outside for the doves to alight upon. This arrangement is now exposed to view, the tower being open internally as high as the floor beneath the bells. The clock, repaired and improved by Mr. Neininger, of Gloucester, stands on a gallery carried midway across the western end of the tower. The new church consists of south aisle and nave, with chancel, and a lean-to aisle on the north, organ-chamber, and vestry. Externally, the walls are of stone from Bredon and Bourton-on-the-Hill; internally, they are lined with Bath stone relieved by bands of red sandstone, which is also introduced into the arches. The timber throughout is oak, the roofs of nave and aisles being open, and the chancel having a polygonal panelled ceiling with arched ribs at intervals. The seats are low, open benches. The windows are glazed with tinted cathedral glass, ornamentally arranged. The passages are paved with ordinary tiles, in three colours, the chancel having an encaustic tile pavement designed by the architect, and supplied by Mr. W. Godwin, of Lugwardine. All the ornamental ironwork to the doors has been specially designed by the architect, and has been wrought at a Gloucester forge. The fittings of the chancel, altar-rail, and altar, sedilia, stalls, and litany-desk, are executed in oak. The builder was Mr. Estcourt, of Gloucester. The church has been built in accordance with the will of the late rector, the Rev. R. E. Landor, out of his estate, and at a cost of between 5,000*l.* and 6,000*l.*

Gildersome.—The church of this village has been re-opened, having been closed for nearly twelve months, owing to alterations that have been made, the sum of about 1,100*l.* having been spent in the work. The style adopted is Early English. The old shed of a chancel has been taken down, and a new chancel built, 14 ft. 6 in. long, and of the full width of the nave. Three chancel arches have been inserted in the old wall, of dressed stone, the centre arch being double the width of the side ones. The chancel contains a small sanctuary, on the north side of the new organ; and on the south, the choir fittings. It is lighted by a triplet east window, with cusped lancet heads, the jambs internally having foliated shafts, carrying arch-moulds. On each side are two single lancet lights. The roof is an open timber one. In the nave, the gallery has been removed, and a part of it erected across the west end, as sufficient accommodation could not be obtained without it. All the old windows have been taken out, and new double-light lancet windows inserted. A flat lath-and-plaster ceiling has been knocked down, and the roof left open, and boarded to the underside of the rafters. The whole of the old pews and floors, which were in a state of complete decay, have been removed, the ground excavated, and new floors laid; and the church has been entirely reseated, with open pitch-pine sittings, varnished. The windows north and south are glazed with tinted cathedral glass, in lead diamond panes. The east window has been filled with stained glass. The centre light contains as a subject, "The Ascension." The subject in the north side-light is "The Crucifixion." The other side-light contains, at the base, "The Lamb and Flag," above which is "The Resurrection. The window has been designed and executed by Mr. W. J. Booer, of Leeds. The new organ consists of two manuals and pedal, and contains, in the great organ, nine registers and 536 pipes, swell organ, six registers and 60 pipes. The builder was Mr. J. Hepworth, of Wakefield. The contractor for the floors and sittings was Mr. Thos. Holliday, of Bradford; and for the other works, Mr. Geo. Johnson, of Morley. The whole of these works have been carried out under the direction of Mr. W. H. Parkinson, architect, Leeds, the greater part of the expense incurred being defrayed by Messrs. Stephenson and R. Holliday, the family of the Stephensons having given the sittings and stained-glass window.

Easton-in-Gordano.—The church of St. George, near Pill, has been rebuilt with the exception of the tower,—to which this is the fourth nave that has been erected,—and has been re-opened for divine worship. The present church consists of chancel, nave, and aisles. The nave is divided from the aisles by three bays of arches, composed of Ham Hill and Bath stone intermixed. The main walls are of local stone, and the window-frames of freestone; the roof inside is open timbered, the ceiling being plastered between the rafters and slated outside, with an open freestone parapet at the sides. The windows are two and three light, and filled with cathedral glass. In the chancel there is a stained-glass window in three compartments, each representing the Saviour Raising the Dead to Life, given as a memorial of Carn de Winton, by his son, William Herbert de Winton. The seats are of Baltic timber, varnished; they are carved, and have open ends. The pulpit is of Bath stone, with Devonshire marble shafts. The panels contain figures of Christ and the four Evangelists. It was presented by Mr. Wilton, son-in-law of the late vicar.

Bristol.—The new nave of All Saints', Clifton, has been opened for divine service. It is now six or seven years since the building was commenced, and it is not yet thoroughly completed. The chancel was first finished, and a temporary nave was erected, under which service was conducted for a considerable time before the necessary funds could be obtained for raising the permanent structure. The financial obstacle having been removed, the permanent nave was built outside the temporary one, and in that manner the services have been carried on until a very short time since, when it became necessary to take down the interior structure and tile the floors. The style of architecture is Early English. The chancel is decorated. The reredos was carved by Mr. Redfern, of London. The length of the new nave is 111 ft. 1½ in., the width between the aisles is 56 ft.; and between the clearstory sills, 42 ft. The height from the floor to the apex of the roof, is 62 ft., and the corners of the roof, 42 ft. 3 in. The roof is decorated. It is intended to fill the whole of the aisle windows with stained glass, but at present the work is only partially done. Up to the present time the entire cost of the building has been about 27,000*l.*, but it is thought that several thousands more will be wanted before it is finished. The architect is Mr. G. E. Street.

Dorking.—The contract with Messrs. Goddard & Terry, of Farnham, for the re-building of St. Martin's Church, has been signed by the vicar and churchwardens, and the work of demolition has been commenced. The copper sheathing of the spire is being removed, and the tower-windows taken out. The contractors will lose no time in proceeding with the works, as the contract specifies that the new church shall be completed in one year from the commencement of operations, viz., on the 1st of August, 1873.

Silian (*Cardiganshire*).—Work has commenced on the church here: it is to be altered and enlarged under the direction of Mr. Withers, architect, at an estimated expense of 700*l.* Mr. Morgan is the builder employed.

Long Ashton.—The church of All Saints, Long Ashton, has been reopened for divine worship, having been restored. The chancel and two chapels have been rebuilt of local wall stone in regular courses, and pointed with blue mortar, with external dressings of Box and Bath stone. Along the upper edge of the chancel-wall is a battlemented parapet in keeping with the walls of the nave; and buttresses crowned with gablets and carved terminals stand at the corners. There are also projecting plinth and bay courses to the chancel and side chapels. The gable cope of the chancel is of moulded Bath stone coved, and surmounted with ornamented saddle-stones and foliated stone cross. The old plastered ceiling of the chancel has been done away with, and its place supplied with a wagon-headed ceiling in oak, moulded. The chapel roofs are similarly treated. Screens of oak separate the chancel from the chapels. The entire flooring at the east end is in tesselated pavement. The steps leading to the communion rails are of Plymouth marble, the rails themselves being of metal. All the seats in the chancel are of oak, with carved ends. The reredos is in the late Decorated style. It is of Caen stone, with Devonshire marble shafts, the panels filled in with emblems of the four Evangelists, and the Agnus Dei in the centre. They are inlaid with mosaics. The south-chancel window is formed of ancient pieces of glass found in various parts of the church. The chancel-screen is by Messrs. Tattersall & Co., of London. All the clustered pillars have been scraped and cleansed; but those from which springs the chancel arch are entirely new. The walls of the body of the church are finished in rough stucco. The side-aisle roofs are of oak, and horizontal, the roof of the nave being wagon-headed in deal boarding, stained and varnished. There are moulded ribs dividing the bays, and carved bosses at the points of intersection. The seats in the body of the church are of pine, having carved ends, and raised 3 in. from the passages, which are tiled throughout. They are open, with reclining backs. A change is effected in the appearance of the west end of the building by the removal of the old gallery at that extremity, by which means the tower arch is exposed to view, and the west window opened up. The space thus gained beneath the tower is thrown into the body of the church, and will in great part compensate for the removal of the gallery. In the north porch the old plastered ceiling is replaced by a new roof of stained and varnished deal, moulded and coved. A new floor of moulded beams has been supplied to the ringers' apartment in the tower; the staircase leading to the belfry is renewed; and the belfry windows are having new louvres placed in them and the tracery made good. The east of the chancel, with large memorial window by Messrs. Clayton & Bell, has been erected to the memory of the late Mrs. Smyth. Upon the left side of the chancel a new and more roomy vestry has been built; and underneath it a heating chamber is constructed, approached by a flight of steps outside. The church is warmed by means of hot water, through pipes beneath the flooring, the requisite apparatus being supplied by Mr. V. Skinner, of Bristol. The total cost of restora-

tion, including the rebuilding of the chancel, will be about 3,000*l.*; but the expense of the new chancel and side chapels will be defrayed by Mr. Gore Langton, M.P., of Newton-park, Bath, and Sir Greville Smyth. The work has been carried out from the design and under the superintendence of Mr. Ferrey, of London, who is engaged upon the work of restoration at Wells Cathedral. The builders are Messrs. Wall & Hook, of Brimscombe, near Stroud.

ROMAN CATHOLIC CHURCH BUILDING NEWS.

Camberwell.—A new church has been opened in Camberwell New-road, close to the London, Chatham, and Dover Railway-station. The church is in the Early English style, 98 ft. long and 47 ft. wide, and is intended to accommodate a congregation of 2,500, which is said to have grown up in this neighbourhood during the last ten years. The architect was Mr. C. A. Buckler, and the builder Mr. Fanthorpe, of Notting-hill. The style of the structure, which is of white brick with stone corblings, is twelfth-century Gothic. The pillars dividing the centre from the side aisles are of Boxhill stone, and their caps are in process of being sculptured by Mr. Earp, of Kennington-road. The altar is of stone, and is carved. It is the gift of Mr. S. Knill, a gentleman residing at Blackheath. The sanctuary floor is laid with rich Minton tiles. That of the body of the church may be described as ordinary tesselated pavement. The organ is now being built by Mr. Richardson, of Camberwell, and will cost 500*l.* The entire cost of the edifice is 2,000*l.*

SCHOOL-BUILDING NEWS.

Kingston.—The foundation-stone of the new Church of England Schools at Kingston-on-Thames has been laid by the Princess Mary, in the presence of a large number of spectators. The committee paid 800*l.* for the site, and about 1,900*l.* had been raised towards the total cost; but at least 1,400*l.* more were required. Mr. C. J. Freake presented the mallet which is said to have been used by Sir Christopher Wren in laying the foundation-stone of St. Paul's Cathedral, June 21, 1673. The schools will accommodate, when completed, 264 boys and 262 girls, allowing, according to the Government standard, 8 ft. superficial for each child. The existing building will be repaired and made available for 200 infants.

Halifax.—The chief stone of St. Joseph's Roman Catholic Schools to be erected on a site near to Godley Bridge, in the field known as "Bloody Field," has been laid. The new buildings will occupy a situation close to the bridge by Godley cutting, and overlooking the town of Halifax. The ground plan is quadrangular, the style Gothic, and with two large school-rooms, class-rooms, and inclosed play-grounds, accommodation will be provided for 600 children. The total cost will exceed 2,000*l.*

York.—The foundation-stone of new national schools for the north-eastern district of York, has been laid in a street called Bedern. The area which the buildings will occupy is over 4,000 ft., and accommodation will be provided for more than 500 children. The schools will cost about 2,000*l.*, and the works will be under the superintendence of Mr. Cane, architect, and clerk of the works at the Minster. The contractor for the works is Mr. Dennison, of Marygate.

Oxford.—The new boys' and girls' schools, which have recently been erected at the south end of Bridge-street, Osney, to meet the requirements of the rapidly-increasing population of this suburb of Oxford, have been opened by the bishop of the diocese. The schools are 72 ft. long, and 18 ft. wide. The ground-floor will be for boys, and the first story for girls, and out of each of these is a class-room, partitioned off, and measuring 20 ft. long by 18 ft. wide. The old building will, in future, be used as an infant school. The whole of the work has been done by subscription, and there is at present a debt of about 200*l.* remaining on the building, which was erected by Messrs. Honour & Castle.

Stockton Exchange Competition.—We have received complaints of want of information in this matter. The remedy is in the complainants' hands,—do not compete unless satisfied.

Books Received.

Patterns for Turning. By H. W. Elphinstone. London: Murray. 1872.

This handsome volume is illustrated with seventy patterns, many of them elegant and curious elliptical and other figures cut on the lathe without the use of any ornamental chuck. All the patterns can be cut on a lathe furnished with a division plate, an ornamental slide rest, an eccentric cutting-frame, and an overhead motion. The reader is requested to peruse the volume by the side of his lathe as he performs the various operations indicated in the text, so as to obviate any serious difficulty in understanding the methods of cutting the patterns. Most of them can be cut by a person capable of performing simple addition or subtraction of numbers containing two figures, and the fractions ¼, ½, and ¾. Some few require a knowledge of decimal fractions. Brief explanations of the geometry of the patterns have been inserted for behoof of mathematicians, and especially as to "envelope" patterns.

The Worshipful Company of Turners, we may here remark, is of practical service to the handicraft whose name it bears. The master, wardens, and court of assistants, in continuation of their good old custom of former years, propose to give, this year, their silver medal and the freedom of the company and of the City of London to any one workman or apprentice in England who may send in the best specimens of hand-turning. The material to be used will be varied in different years, so as to include wood, ivory, metals, stone, spar, &c. The competition for this year will be in turning in hardened and tempered steel. The subject of the competition will be horological turning, whether exhibited in the turning and finishing of pinions of chronometers and watches, or in any of the various escapements used in the same. Competitors will be at liberty to select their own subject for exhibition in turning and finishing, whether in wheel-work or the escapement; but the complete escapement or train of wheels planted in position, to show the truth and accuracy of the same, will be desirable. The successful candidate will be required to supply a satisfactory certificate of the work having been done by his hands only, and of its being done during the period of competition, and may be required to do, in the presence of the judges, a portion of work similar to the successful exhibit. In addition to this prize, the bronze medal of the company will be given to the competitor second in merit, and the company's certificate of merit to the third. The different objects must be delivered free at the Mansion House, London, during the week beginning Monday, October 21st, and ending Saturday, October 26th. Sir William George Armstrong, C.B., of Newcastle; Sir J. Brown, of Sheffield; Mr. John Jones, of the Strand, London; and Mr. S. Jackson, of Red Lion-street, Clerkenwell, are the judges for this year.

Miscellanea.

Brighton Sewers Board.—At a special meeting of this body held last week for the purpose of accepting a tender for the completion of the unfinished sewer works, the General Purposes Committee reported that eleven had been sent in, namely, from Messrs. John Hall Clark, Warwick; John Aird & Sons, Belvidere-road, London; W. & J. Pickering, 21, New Bridge-street, Blackfriars; George Thomas Parnell, Glo'ster Lodge, Dale-road, Kentish-town; H. A. Marshall, 68, Islingword-road, Brighton; James Neave & Co., Edmonton, Middlesex; Matthew Jennings, 3, Adelaide-place, London Bridge; Thomas Pearson, Kennington-cross, Lambeth; A. W. Ritson, 4, Herne-hill-road, Camberwell; W. Webster, 8, St. Martin's-place, Trafalgar-square, London; and Crockett & Dickenson, King's-road, St. Pancras. Ultimately the tender of Messrs. Aird & Sons was accepted, for the sum of 58,472*l.*, which was the lowest sent in.

Inigo Jones.—A correspondent of *Notes and Queries* asserts that Inigo Jones was baptised Ynyr, a common Welsh name, but corrupted into Inigo abroad; and that in Wales the architect was known as Inco, a name which still adheres to a house he is said to have built—"Tyddgn Inco," or Inigo's Farmhouse, near Bala.

Sir Christopher Wren's Mallet.—Some doubt is entertained as to whether the mallet which was used by her Royal Highness the Princess Mary in laying the foundation-stone of the Kingston Church Schools, was used by Sir Christopher Wren, as alleged, in laying the foundation-stone of St. Paul's Cathedral. The *Times* says, "The mallet itself bears the following inscription on a silver plate:—'By order of the M. W. the Grand Master his Royal Highness the Duke of Sussex, &c., &c., and W. Master of the Lodge of Antiquity, and with the concurrence of the brethren of the Lodge, this plate has been engraven and affixed to this mallet, A.L. 5831, A.D. 1827, to commemorate that this being the same mallet with which His Majesty King Charles II. levelled the foundation-stone of St. Paul's Cathedral, 5677, A.D. 1673, was presented to the Old Lodge of St. Paul's, now the Lodge of Antiquity, acting by immemorial constitution, by Brother Sir Christopher Wren, R. W. D. G. M., Worshipful Master of this lodge, and architect of that Cathedral.' It is not disputed that this is the identical mallet used on the occasion of laying the foundation-stone of St. Paul's, nor is it denied that it was subsequently in the possession of Sir Christopher Wren. The only question is whether the mallet was used by the architect himself, as stated by Dean Milman in his 'Annals of St. Paul's,' or whether the stone was laid or 'levelled' by Charles II., as alleged by the Lodge of Antiquity in the above-quoted inscription."

Sale of Land in Kent.—On the 13th inst., at Ashford, Mr. James Waterman, jun., conducted a large land and property sale, under an order of Vice-Chancellor Sir R. Malins, in the cause of Whelan *v.* Whelan. The property, which is the outlying portion of the Heronden Hall Estate, comprised an area of 346 acres, and was put up in twenty-two lots. The room was crammed, and a spirited competition took place for some of the lots. Lot 1, a farm known as "Hope Farm," having an extent of 44 a. 3 r. 7 p., realised 3,400*l.* Lot 3, a freehold estate of rich marsh and pasture land, known as "Cole Farm," comprising 143 a. 2 r. 12 p., realised 11,400*l.* For lot 4, 1 a. 2 r. 12 p., of pasture land, 120*l.* were offered; not sold. Lot 6, realised more than 100*l.* per acre; it was a piece of pasture fatting land, containing 5 a. 0 r. 15 p. Lot 7, 27 a. 1 r. 34 p. of fresh marsh land, in Snargate and Brenzett, in two pieces, sold for 2,880*l.*, being over 100*l.* per acre. Lot 8, 38 a. 3 r. 13 p. of pasture land, situate in Shirley Moor, in the parish of Tenterden, fetched 3,100*l.* Lot 10, 2 a. 3 r. 35 p. of pasture land, fetched 230*l.* Lots 11 to 18 were principally property situated in Tenterden Town, and they realised very fair prices. Lot 19, described as several parcels of accommodation pasture land, containing 16 a. 3 r. 18 p. fetched 1,390*l.* The seventeen lots sold realised close upon 25,000*l.*

Removing Slag from Blast Furnaces.—The improvements of Mr. David Joy, of Middlesbrough, consist in receiving the slag as it runs from the furnace into the recesses formed in the rim of a wheel or cylinder (either outside or inside or on the edge thereof), in which it is carried through a part of the revolution of such wheel or cylinder, and then discharged therefrom, the axis of revolution of such wheel or cylinder being either horizontal or inclined, in suchwise that each part of the circumference shall alternately be raised and lowered during the revolution. And he makes the recesses of such form, and places them in such position with regard to the centre of revolution, that the slag may be retained in them during a considerable part of the revolution of the wheel or cylinder. And if necessary he forms ridges in points in the bottoms of the recesses to mould the slag in such form as to break easily in pieces.

The Adulteration Act.—The statute to amend the law for the prevention of adulteration of food and drink, and of drugs, has just been issued. Every person who shall adulterate articles of food, or drink, or drugs shall, for the first offence, pay a penalty not exceeding 50*l.*, and for a second offence be guilty of a misdemeanour, and be liable to six months' imprisonment. The Pharmacy Act is to be incorporated with the present statute. The inspectors of nuisances may submit articles to be analysed. There is a provision that the purchasers of articles of food, &c., may require the same to be analysed. We may take the credit of being amongst those who laboured to obtain legislation in this matter.

Asserted Poisoning by a Galvanised Iron Roof.—The *Bendigo Independent* mentions that some time since a man living in a hut with a galvanised iron roof, situated in close proximity to Koch's crushing-machine, in Long Gully, was taken ill and removed to the hospital. He was there—the symptoms being slight, though the disease appeared serious—treated tentatively, and recovered sufficiently to be discharged. Hardly had this been the case, when his mate, who was suffering from a precisely similar form of disease, was admitted into the same institution, and the coincidence at once attracted attention. An examination proved that the usual sign of arsenical slow-poisoning was present,—the white line on the nail,—and Dr. Macgillivray and Dr. Stuart drove out to the hut, where they found, not only the roof coated with an arsenical compound, but an arsenical sediment in the tank of water attached to the premises. The first man again betrayed symptoms of poisoning, and an examination proved, beyond doubt, that a second poisoning had commenced. Under proper treatment both are out of danger.

Ecclesiastical Dilapidations.—An alteration of some importance has been made in the new Act to amend the Ecclesiastical Dilapidations Act, 1871, with respect to fees to bishops' secretaries and others, on which complaints have been made. The Act alters the length of mortgage terms, and of the conditions of repayment of the advances. It then provides that it shall be lawful for the Archbishop of Canterbury, the Lord Chancellor, and the Archbishop of York, with the assistance of the two vicars-general of the archbishops, with the consent of the Treasury, at any time during the year 1873, to review the rates of the fees of the bishops' secretaries and registrars, and the rates of surveyors' charges for work done in pursuance of the Ecclesiastical Dilapidations Act, 1871, and establish, in lieu thereof, one uniform table of fees and charges, to be binding throughout the whole of England and Wales, and that they shall have power from time to time to amend or alter such table of fees and charges.

The Atmospheric Disturbances. — Mr. T. L. Plant, writing at Birmingham to the local *Gazette*, says,—"The remarkable frequency of thunderstorms this summer has been the subject of much surprise. Commencing with the 15th of May, Birmingham and the district have had no less than thirteen distinct storms of the most terrific violence. . . . . With nearly five months of the year unexpired, we have had upwards of 30 in. of rain already recorded, and which is about 1 in. over our year's average value. It is 4½ in. above the quantity which fell in the entire year of 1870. This enormous depth of rain is, of course, quite unprecedented in my records, and is 13 in. above the average."

Archæological Congress at Brussels.—To-day (Thursday) the congress on pre-historic archæology opens in Brussels, under the fitting presidency of one of the oldest *savans* in Europe. M. d'Omadius d'Halloy, who presides at the sittings of the congress, is in his 90th year. More than 600 names have been sent in to the committee of organisation. The Government, it is stated, have given instructions for striking a medal commemorative of this meeting. Excursions will be undertaken to Namur, Spiennes, and Forfooz. General Faidherbe is to read a paper on the "Dolmens" of Algeria; M. Ubago one on the flint implements of Dutch Limbourg; and M. Burmeister, director of the Museum of Buenos Ayres, one on the pre-historic flints of La Plata.

Tattershall Castle, Lincolnshire. — The drawings by Mr. F. H. Reed, illustrating this magnificent ruin of the fifteenth century, which were lately sent in for and obtained the silver medal, and 5*l.* 5s., offered by the Institute for measured drawings, and an additional grant in consideration of the thoroughness of the illustration, will shortly be published. The original drawings, fifteen in number, will be reproduced in publication by photo-lithography.

Stonehenge.—Sir John Lubbock writes to the daily papers to communicate a fact which, as he says, will surprise and grieve archæologists. "It appears that the occupier of the farm near Stonehenge is actually ploughing up the well-known 'cursus.' I have no means [he adds] of ascertaining here by whom this land is occupied, nor to whom it belongs." It is to be hoped this will be put a stop to without loss of time.

The Paris Hotel de Ville.—If the Hôtel-de-Ville of Paris does not rise speedily from its ruins, says *Galignani*, it will not be from a dearth of architects, as the number of those who have already inscribed their names to take part in the competition for the reconstruction of the building is 422.

The Price of Gas.—The rise in the price of coal is inducing the gas companies to increase the price of their gas. In some towns the advance has reached 1s. 8d. per 1,000 cubic feet.

TENDERS

For manufacturing premises, Bromley. Messrs. Hills & Fletcher, architects. Quantities supplied:—

Sheffield	£3,575 0 0
Grover	3,375 0 0
Aldous	3,228 0 0
Atherton & Latta	3,200 0 0
Gregan	3,195 0 0
Abraham	3,175 0 0
Alexander	3,130 0 0
Wicks, Bangs, & Co. (accepted)	2,990 0 0

For the erection of villa residence, at Peckham-rye, for Mr. Wilson. Messrs. Tolley & Dale, architects. Quantities by Mr. Birdseye:—

Pollard	£1,530 0 0
Sabey & Son	1,514 0 0
Blake & Ramplen	1,473 0 0
Nutt & Co.	1,458 0 0
Knight	1,375 0 0
Thomas	1,300 0 0
Nightingale	1,298 0 0
Hiscock	1,280 0 0

For the erection of new farmhouse and stabling, Twinstead, Essex:—

Rogers	£1,150 11 8
Grimwood & Sons	1,140 0 0
Hawkins	997 0 0

For Primitive Methodist chapel, Coniston, near Swine, Holderness. Mr. Frank N. Pettingell, architect:—

Pickering (accepted)	£199 0 0

For main sewers, manholes, flushing-chambers, and other works, at Portmadoc. Messrs. Roberts & Morrow, engineers:—

Lewis & Co.	£1,052 0 0
Scott (accepted)	950 0 0

For villa residence, for Captain Parry, Crystal Palace Park. Mr. John Norton, architect. Quantities by Mr. Thacker:—

Aitchison & Walker	£3,307 0 0
Holmes	2,690 0 0
Lyons	2,636 0 0
Turrell	2,630 0 0
Alen	2,622 10 0
Wigmore	2,610 0 0
Stephenson	2,573 0 0
Wagner	2,530 0 0
Staines & Sons	2,497 0 0
Elliott	2,415 0 0
Hughesdon	2,400 0 0
Gough	2,340 0 0
Lord	2,293 0 0
Warr	2,249 0 0
Waterson & Co.	2,179 0 0

For the erection of a house and offices, at Manton, Kirton-in-Lindsay, Lincolnshire, for Mr. M. W. Dalison. Mr. J. M. Hooker, architect. Quantities supplied:—

Holt, Brothers	£2,899 0 0
Booth, Illingworth, & Son	2,720 0 0
Halliday & Cave	2,545 0 0
Hobson & Taylor	2,275 0 0
Huddlestone & Son	2,025 0 0

For the erection of a cottage hospital, at Sevenoaks, Kent. Mr. John M. Hooker, architect:—

Anscomb	£925 0 0
Wiltshire	894 0 0
Wheatley	838 0 0
Nutter & Warren	822 0 0

For sewers for the Sevenoaks Local Board of Health. Mr. John M. Hooker, architect:—

Willis	£263 10 0
Wiltshire	245 15 0

For erecting house and offices, at Sevenoaks, Kent. Mr. John M. Hooker, architect. Quantities supplied:—

Anscombe	£2,723 0 0

For rebuilding the Colosseum Coffee-house, 291, Euston-road (exclusive of trade fittings). Mr. Henry Lovegrove, architect. Quantities supplied by Mr. W. H. Barber:—

Bishop & Hooper	£1,413 0 0
Brighton	1,289 0 0
Stimpson & Co.	1,245 0 0
Nightingale	1,148 0 0
Patman & Fotheringham	1,130 0 0
Hibbins & Trasler	1,120 0 0
Scrivener & White	1,080 0 0

For rebuilding 135A, Tottenham-court-road (exclusive of trade fittings). Mr. H. Lovegrove, architect. Quantities supplied by Mr. W. H. Barber:—

Bishop & Hooper	£649 10 0
Stimpson & Co.	575 0 0
Patman & Fotheringham	545 0 0
Nightingale	539 0 0
Brighton	530 0 0
Scrivener & White	503 0 0
Hibbins & Trasler	499 10 0

For entrance-lodge, at Wandsworth, for the Royal Commissioners of the Patriotic Fund. Mr. H. Saxon Snell, architect:—

Chappell (accepted)	£423 0 0

For rebuilding Quantoxhead Rectory, Somerset. Mr. J. Norton, architect. Quantities by Mr. Thacker:—

Wall & Hook	£2,980 0 0
Diment	2,285 0 0
Trask	2,156 0 0
Davies	2,126 0 0
Shewbrook	1,895 0 0

For the erection of detached villa, at Stanley-road, Sutton, for Mr. W. A. A. Reeve. Mr. H. A. Alexander, architect:—

Eaton & Chapman	£1,379 0 0
Potter & Ferrige	1,245 0 0
Garrud	1,183 0 0

For the erection of detached villa, at Denmark-road, Carshalton, for Mr. William M'Master. Mr. H. A. Alexander, architect:—

Rabbits (accepted)	£950 0 0

For new schools and master's residence, at Lancing, Sussex. Mr. R. Adolphus Came, architect:—

Watson	£780 0 0
Miles (accepted)	765 0 0

For cottages and offices, in Meeson Wharf-road, Stratford. Messrs. Hills & Fletcher, architects. Quantities supplied:—

Gregar (accepted)	£480 0 0

For the erection of a warehouse, in Commercial-road East, for Messrs. Williams & Davis. Mr. E. Ellis, architect. Quantities by Messrs. Curtis:—

Ennor (accepted)	£1,111 0 0

For additions, alterations, and repairs to Oaklands Hall, Kilburn, for Sir Chas. A. Murray. Mr. Robert Booth, architect. Quantities supplied:—

Fish	£3,476 0 0
Stimpson & Co.	3,285 0 0
Bywaters	3,253 0 0
Watts	3,223 0 0

For repairs to White Lodge, Putney. Mr. Sancton Wood, architect:—

Stimpson & Co.	£325 0 0
Godden	275 0 0

For additions and alterations to 14, Rutland-gate, for Mr. S. H. Godson. Messrs. Lee (Brothers) & Pain, architects:—

Pain	£539 0 0
Stimpson & Co. (accepted)	535 0 0

For building new stable, at East Sheen, for Mr. R. W. Willis. Mr. E. Ingress Bell, architect. Quantities supplied:—

Stimpson & Co.	£698 0 0
Hibbins & Trasler	691 0 0
Sharpington & Cole	653 0 0
Gibbs	630 0 0

For five cottages, at Lifford-street, Putney, for Mr. E. P. Charlewood. Mr. Sancton Wood, architect:—

Aviss	£1,048 0 0
Foster	1,035 0 0
Stimpson & Co. (accepted)	955 0 0

For studio, The Priors, Hampstead, for Mr. W. S. Cookson. Mr. Horace Field, architect:—

Nightingale	£965 0 0

For works to St. Augustine's Church, Highbury. Messrs. E. Habershon & Brock, architects:—

Carter & Son	£736 0 0
Nightingale	712 0 0
Kindell	671 7 0
Haynes	664 15 0

TO CORRESPONDENTS.

F. I. (thanks: we do not propose to engrave the plans now).—S. H. (architectural examinations would be heard of at the Institute, No. 9, Conduit-street).—S. D. (in type).—W. C. (remedy must be adapted to the particular circumstances).—W. H. A.—E. W. T.—F. F.—K. & Sons.—A. F.—E. A.—C. B. A.—W. S.—W. H. E.—J. N.—R. T.—M. H. J.—La F. & Co.—E. A. S.—G. & Co.—J. A.—E. G.—J. G. J.—A. R.—K.—J. R. V.—T. O.—S.—J. S. P.—F. B. P.—J. H. S.—L. T.—H. G.—W. A. M.—F. B.

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